THE UNIVERSITY OF SANTA CLARA

CATALOG · 1964-1965

SANTA CLARA · CALIFORNIA · 95053

THE UNIVERSITY OF SANTA CLARA

CATALOG

1964-65

THIS CATALOG IS COMPOSED OF THE FOLLOWING PARTS

I
INTRODUCTION AND GENERAL INFORMATION

II
COLLEGE OF ARTS AND SCIENCES*

III
SCHOOL OF BUSINESS*

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SCHOOL OF ENGINEERING*

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OFFICERS AND UNDERGRADUATE REGULATIONS
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*These Sections appear separately as individual catalogs and are here bound together for the convenience of schools, colleges, and libraries. Any of the foregoing publications may be obtained by addressing the REGISTRAR, UNIVERSITY OF SANTA CLARA • SANTA CLARA CALIFORNIA • 95053

L/D courses = 4 quarter units (without lab.)
5 " " (with lab.)

U/D " = 5 " " (without lab.)
6 " " (with lab.)

SECTION I

INTRODUCTION AND GENERAL INFORMATION

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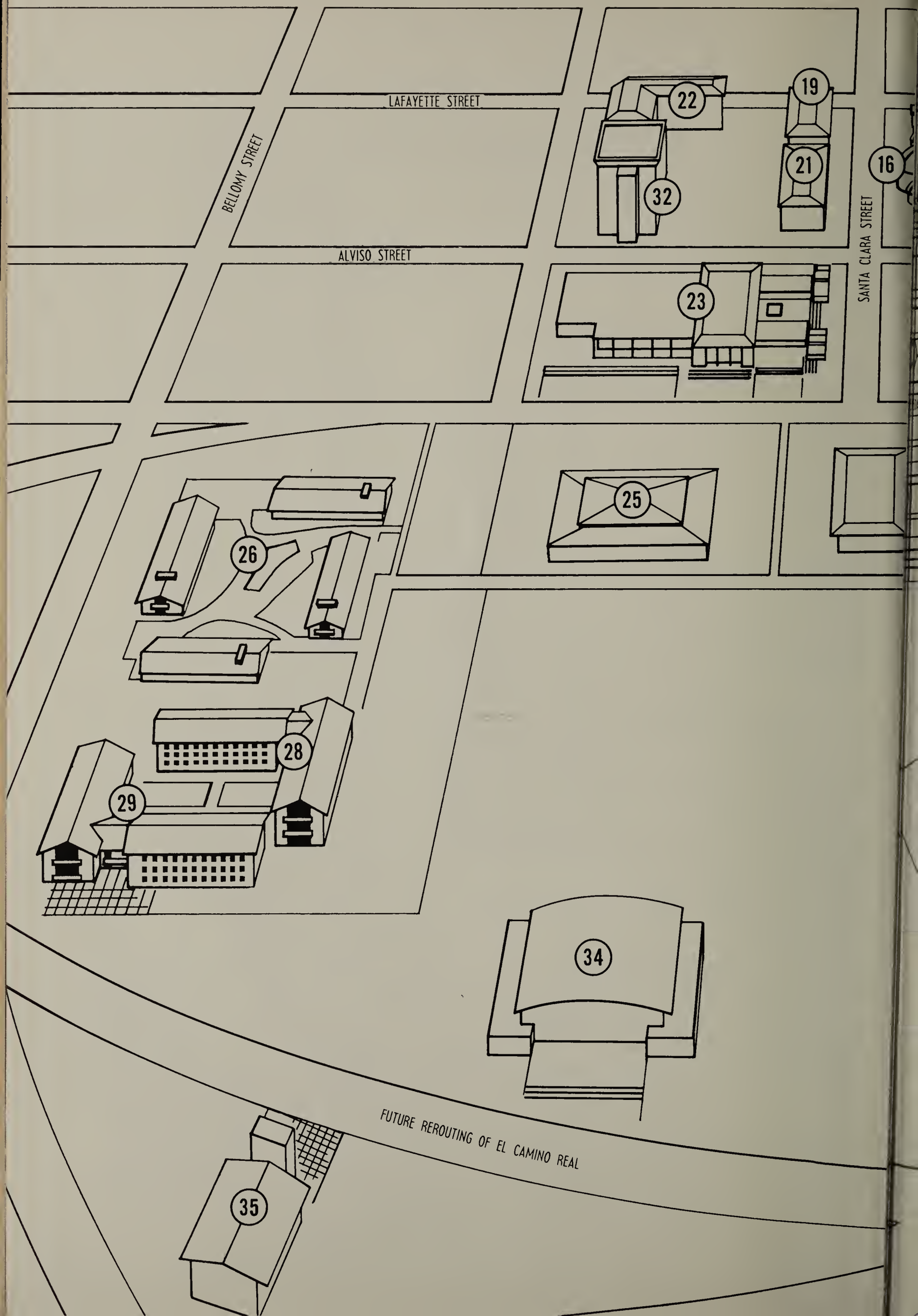
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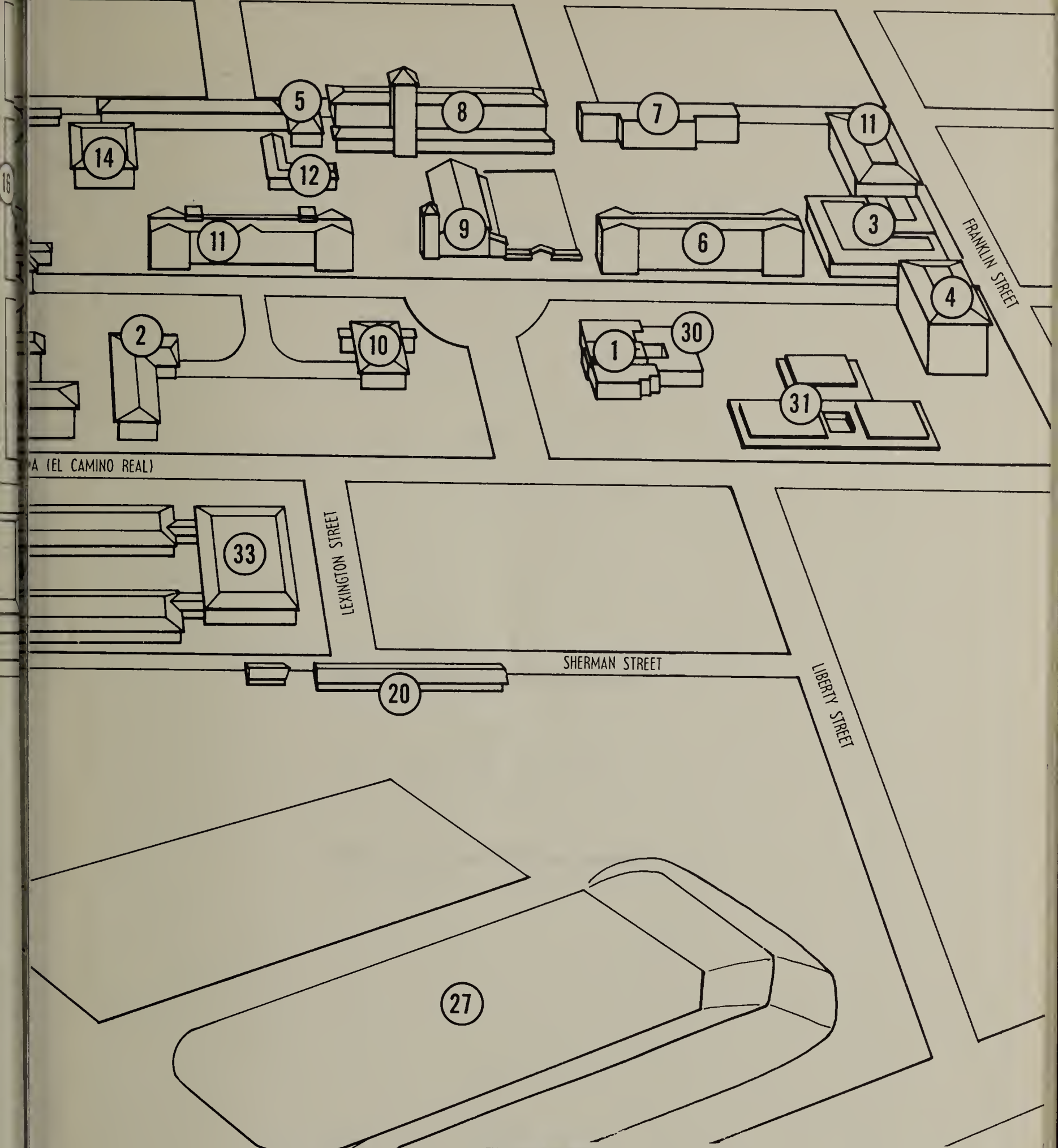


EXISTING BUILDINGS

1 De Saisset Art Gallery
2 Edwin A. Heafey Law Library
3 Seifert Gymnasium
4 Alumni Science Hall
5 Central Heating Plant
6 O'Connor Hall
7 Montgomery Laboratories
8 Nobili Hall
9 Mission Church
10 Delia Walsh Hall
11 Faculty Residence
12 Adobe Lodge
13 Service Buildings
14 Varsi Library
15 Donohoe Infirmary
16 Ricard Observatory
17 Kenna Hall
18 Bergin Hall
19 James Walsh Hall
20 Club House
21 Edward McLaughlin Men's Residence Hall
22 James F. Dunne Men's Residence Hall
23 Robert F. Benson Memorial Center
24 George L. Sullivan Engineering Center
25 Michel Orradre Library
26 Charles Graham Women's Residence Center
27 Buck Shaw Stadium
28 Women's Residence Hall Stage No. 1
29 Women's Residence Hall Stage No. 2

FUTURE BUILDINGS

30 Art Gallery Addition
31 Science Addition
32 Men's Residence Hall
33 Engineering Center Addition
34 Field House (Including ROTC)
35 Theater

the Purpose

The University of Santa Clara might make the eloquent but vain promise that a college education prepares a person for whatever crisis he finds contemporary. But if the University is a seeker after truth, it would be inconsistent to make so sweeping, if attractive, a promise. Rather, we would answer with Cardinal Newman, in his *Idea of a University:*

"If then a practical end must be assigned to a university course, I say it is that of training good members of society. Its art is the art of social life, and its end is fitness for the world. . . . A university is the great ordinary means to a great but ordinary end; it aims at raising the intellectual tone of society, at cultivating the public mind, at purifying the national taste. . . . It is the education which gives a man a clear conscious view of his own opinions and judgments, a truth in development of them, an eloquence in expressing them, and a force in urging them. . . . He is at home in any society, he has common ground with any class: he knows when to speak and when to be silent; he is able to converse, he is able to listen. . . . He has a gift which serves him in public, and supports him in retirement, without which good fortune is but vulgar, and with which failure and disappointment have a charm."

Thus, while Santa Clara promises no resounding, triumphant solutions to the problems which beset the world, it remains confident that its efforts are excellently geared to the production of the balanced person.

PATRICK A. DONOHOE, S.J.
President

educational Philosophy

A private institution of higher learning ever must keep a challenging goal before it. It must make the firmest commitment to intellectual enlightenment as it progresses toward the elusive objective of excellence in rapidly changing times. Further, the institution with a religious affiliation must include in its aim a strong intellectual dedication to God and the advancement of the Judaeo-Christian ethic.

As an institution founded on high moral principles and, because of its size, one with a marked degree of adaptability to the changing needs and influences of civilization, the University of Santa Clara views its role in higher education as one of academic leadership. The word "mass" has no place in the Santa Clara context. Each student is, and always will be, treated as an individual with individual aspirations, interests, enthusiasms, and problems. His teachers will always be competent, thorough, interested in him personally, and will have, insofar as such conditions are practical, no distracting nonacademic avocations.

For his part, the faculty member at Santa Clara considers the teaching of students an ennobling career and makes no apologies for it. He recognizes that research—the search for truth—is part of the teaching function but not the sole aim. The dissemination of truth through publications and the teaching of the students who attend the University are equally important objectives which differentiate a University from such other similar social institutions as hospitals and commercial research institutes. One of the faculty member's primary pedagogical concerns is to maintain a professional competence in his field. His interest must be alive, current, exciting. He strives to create an abrasive intellectual atmosphere both in and outside the classroom. He sees his profession not just as a job of teaching, but as an obligation to involve himself deeply and personally in the academic, cultural, and spiritual growth of his students. He listens, counsels, and instructs them; he wrests from them the best they have to offer.

The administration recognizes that much of the success of its mission rests on creating an environment that encourages a spirit of individual inquiry and creative thought. Thus, the faculty member enjoys a wide latitude of academic and religious freedom. Other than the requirement that he maintain a nonantagonistic attitude toward Catholic beliefs and practices, he is free to follow his own religion.

The University will always endeavor to provide the best possible physical and professional atmosphere. It maintains its physical plant in the best possible condition, limited only by the generosity of its supporters in supplying the free funds essential to a private institution. Because there is this limiting factor, the University of Santa Clara will never place more emphasis on bricks and mortar than it does on the people for whom they are only tools. The faculty member and student shall always come first.

HISTORICAL PERSPECTIVE

The United States of America and the University of Santa Clara had their origins almost simultaneously.

Less than six months after the signing of the Declaration of Independence, near the site of the present city of Santa Clara, the Franciscan padres, de la Pena and Murguia, planted the cross marking the eighth of the original 21 California missions. The date was the 12th of January, 1777.

Three-quarters of a century elapsed before Santa Clara College opened its doors as an institution of higher learning, but in the intervening years Mission Santa Clara de Asis had served as a spiritual guidepost and mission school for the Indians. The men were taught farming; the women were taught to sew. The families were fed at the Mission, and during the first quarter of the nineteenth century, more than 8,000 were baptized Christians.

During this early period, the Mission was destroyed – first by flood and later by earthquakes and fire. Even today there is no unanimity of opinion on the number or exact locations of the Missions, but it is beyond question that the campus surrounds the site of the Mission which was rebuilt in 1822. Certainly, an adobe structure, which has become the faculty club, was part of the 1822 enclave.

These were tumultuous times for California and for Mission Santa Clara. The first half of the Nineteenth Century saw it deteriorate from the wealthiest of all the Spanish Franciscan Missions, with nearly 200,000 head of livestock and vast lands under cultivation, to several decaying buildings and less than an acre. A combination of factors contributed to the dwindling holdings and diminishing influence of the Mission: first, the Mexican war with Spain, which dragged on from 1810 to 1821, eventually resulted in a decree that all Spaniards must leave Mexican territory. Even though it took years for the order to reach Mission Santa Clara, the Spanish Franciscans were finally replaced with Mexican Franciscans in 1833.

The Mexican padres had little interest in maintaining the vast holdings, since the money from crops and livestock, the "pious fund" used to maintain the Missions, was under threat of confiscation by the new government. The lands were to be returned to the Indians, who had little talent for farming.

Nevertheless, the "Garden of the World," as the Santa Clara Valley was known, offered great attraction to American settlers, and by the time California had been won from Mexico in 1848, the area had been heavily repopulated. The Gold Rush, begun by the discovery at Sutter's Mill, briefly decimated the population again, but stability shortly returned to the area, and by 1849 the State Constitution was ratified and San Jose enjoyed a brief moment of early glory as California's first capital when California was admitted to statehood in 1850.

This was the setting in which the new Santa Clara College was established a year later. The Right Reverend Joseph Sadoc Alemany, O.P., the new Bishop of the San Francisco Diocese, recognized the need for an institution of higher learning to serve the growing population and determined, at the same time, to save the historic, decaying Mission.

With only $150 and some inspiring words of encouragement, John Nobili, a Jesuit Priest, was asked to become pastor of the Mission and to start a college. What Nobili that year had termed ". . . the germ only of such an institution as we would wish to make it and as the wants of the community will require . . ." has grown into a full-fledged university with total assets of more than $33,000,000 and a budget in excess of $6,000,000 annually.

But when Santa Clara College opened its doors more than a century ago, a faculty of two taught sixteen students. Just three years later, the faculty outnumbered that first student body and 102 students were enrolled. And then as now, in the words of Nobili, ". . . it is a Catholic school, yet those of other Faiths are admitted also, and their religious opinions are not interfered with . . . to cultivate the heart . . . a care of morals, no less than intellectual improvement, are duties kept sacredly in view . . ."

The fortunes of the "Mission School" were inextricably tied up with those of California. Reflecting the needs of the times, when the state was filled with prospectors and farmers, the opinions of the Departments of Metallurgy, Agriculture, and Horticulture were much sought after as arbiters of final authority. With time, these have passed into history and new departments have sprung up to take their place.

But the growth was not as steady as a brief recital of a century of facts might indicate. There were lean years. In the early days the community was relatively stable and the economy was agrarian as late as the 1930's and '40's. Liberal and professional educations were viewed more as luxuries than as valuable assets for a full and rewarding life.

The eight "branches" of the College, as they were called before the turn of the century, included "Rational Philosophy, Natural Sciences, Mathematics, Belles-Lettres, Arithmetic, Penmanship and Book Keeping, History and Geography, Modern Languages and Fine Arts." It was rather a neat balance between humanism and practical technique.

The College grew and prospered. It waited until just before World War I before it felt it had merited the title "University" with which it had been chartered in 1851. The new name was coincident with the founding of the Colleges of Engineering and Law, which had previously been departments offering a handful of courses.

In 1926, a College of Business Administration opened its doors as the University reflected the urban growth around it and presaged a transition from agriculture to industry yet to come.

The period before World War II was one of relative stability. Ricard Observatory was built, and the new Bergin Hall opened its doors to law students for the first time. It was a time when Santa Clara became a football power, and a "Bronco" athletic tradition was born.

When the veterans of World War II returned to campuses all over the country, the University and the San Francisco Bay Area were on the threshold of a new era. A tremendous population influx had begun, and, with it, industrialization dramatically increased its tempo.

Student enrollment has nearly tripled since World War II – from 880 to 2150 in the Fall of 1964. Graduate students, a relatively new group since the mid-1950's, now number about 1800.

In the first postwar decade, a new administration building; two dormitories, Walsh and McLaughlin Hall; and deSaisset Art Gallery were built with private funds. Later, the first three units of the Sullivan Engineering Center were also completed and a Law Library was completed in 1963, a gift of Edwin A. Heafey.

Aside from several dormitory buildings, the two most impressive additions to the campus in recent years are the Benson Memorial Center for students, completed in 1963, and the Michel Orradre Library, which opened in the summer of 1964. The Center contains student, faculty, and guest dining rooms; a coffee shop; a bookstore; a barber shop; lounges; student office; and such recreations as bowling and pool.

The Orradre Library adds nearly three acres of floor space to the campus and has a capacity of over 500,000 volumes.

Inasmuch as all undergraduates who do not live with parents or adult relatives must live on campus, the University maintains three residence centers for women and has a fourth under construction. There are five men's dormitories and another is under construction. Both new structures will be ready for occupancy in the Fall of 1965.

All of the dormitories provide as homelike an atmosphere as possible within the framework of the University's educational requirements. Two of the women's residences have swimming pools, since the men have their own pool in the Seifert gymnasium. Even such personal preferences as a nonsmoking roommate can be served, and all but Freshmen can request a specific hall and roommate, if they wish.

LOCATION

The University of Santa Clara is 46 miles from San Francisco near the southern tip of the Bay. Railroad and bus and car transportation by freeway places the renowned cultural and entertainment centers of San Francisco, Berkeley, Oakland, and Marin County within one hour's travel. In the opposite direction are the beaches of Santa Cruz and less than two-hours drive from the campus is the world-famed Monterey Peninsula and Carmel.

The University is accessible by all major railroads, by major airlines via San Francisco International Airport, and by United Airlines and Pacific Airlines at San Jose Airport – about three miles from the campus.

THE CAMPUS

Santa Clara's campus has grown almost as dramatically as its enrollment. An increasing number of its new buildings are being placed across El Camino Real (or "King's Highway") opposite the original campus. Forty-eight buildings cover its sixty-seven acres and, despite the historic traditions of the buildings and the blending of early Spanish Colonial architecture with modern convenience and utility, the campus has lost none of the serenity or charm with which it was originally endowed well over a century ago. The well-kept lawns and lush gardens reflect the richness of the soil and the temperate climate of the Santa Clara Valley, which was once called the "Garden of the World." The campus is set with immense redwoods, includes spruces, sycamores, and olive trees, and is lined with tall date palms.

THE SANTA CLARA PLAN

The academic calendar and curriculum has undergone an extensive reorganization at the University. It was instituted in the Fall of 1964 and its aim was both to simplify and to strengthen a student's program.

Briefly, the Santa Clara Plan divides the academic year into three eleven-week terms and limits the number of courses a student takes each term to three or four.

The Plan is a variation of the "Three-Three" method of education which is a recent innovation in other outstanding liberal arts colleges, such as Dartmouth, Carleton, and Occidental. "Three-Three" simply means a student takes three courses in each of three terms.

The most important departure from the "Three-Three" plan is that freshman and sophomore students will take four courses each term instead of three. This addition was designed to ease the student's transition from high school and to help him establish effective study habits before he reaches upper-division work. In his junior year, he will enter the standard "Three-Three" program, taking only three courses per term, which will require a marked degree of independent study on his part.

Each student's classes will meet four times each week on Monday, Tuesday, Thursday, and Friday. When he graduates, each student will have taken a total of 42 courses, all of equal length. The unit system of credit traditionally used has been eliminated and the student is able to concentrate on a few subjects at a time in depth. Under the traditional system, he would have taken approximately twice as many courses at any given time.

The Santa Clara Plan affords the opportunity for each student to supplement classwork by independent, but directed, research to the end that both the quality and the scope of his education is enhanced.

When the program was first announced, Rev. Patrick A. Donohoe, S.J., President of the University, said, "The goal we seek is to produce a responsible citizen, armed with fundamental knowledge, an inquiring mind, and enough good habits of self-discipline to last him a lifetime."

DIVISIONS OF THE UNIVERSITY AND CURRICULUMS

Santa Clara offers varied undergraduate and graduate curriculums. In the three undergraduate colleges the programs are:

- *College of Arts and Sciences* –

  Biology, Chemistry, Creative Arts, Economics, English, History, Language, Mathematics, Philosophy, Physics, Political Science, Pre-Medical, Pre-Dental, Psychology, Social Science, Sociology, Theatre Arts, Honors in Humanities, Honors in all preceding major fields.

- *School of Business* –

  Accounting, Economics, Finance, Marketing, Production Management.

- *School of Engineering* –

  Civil, Electrical, and Mechanical Engineering.

- *School of Law* –

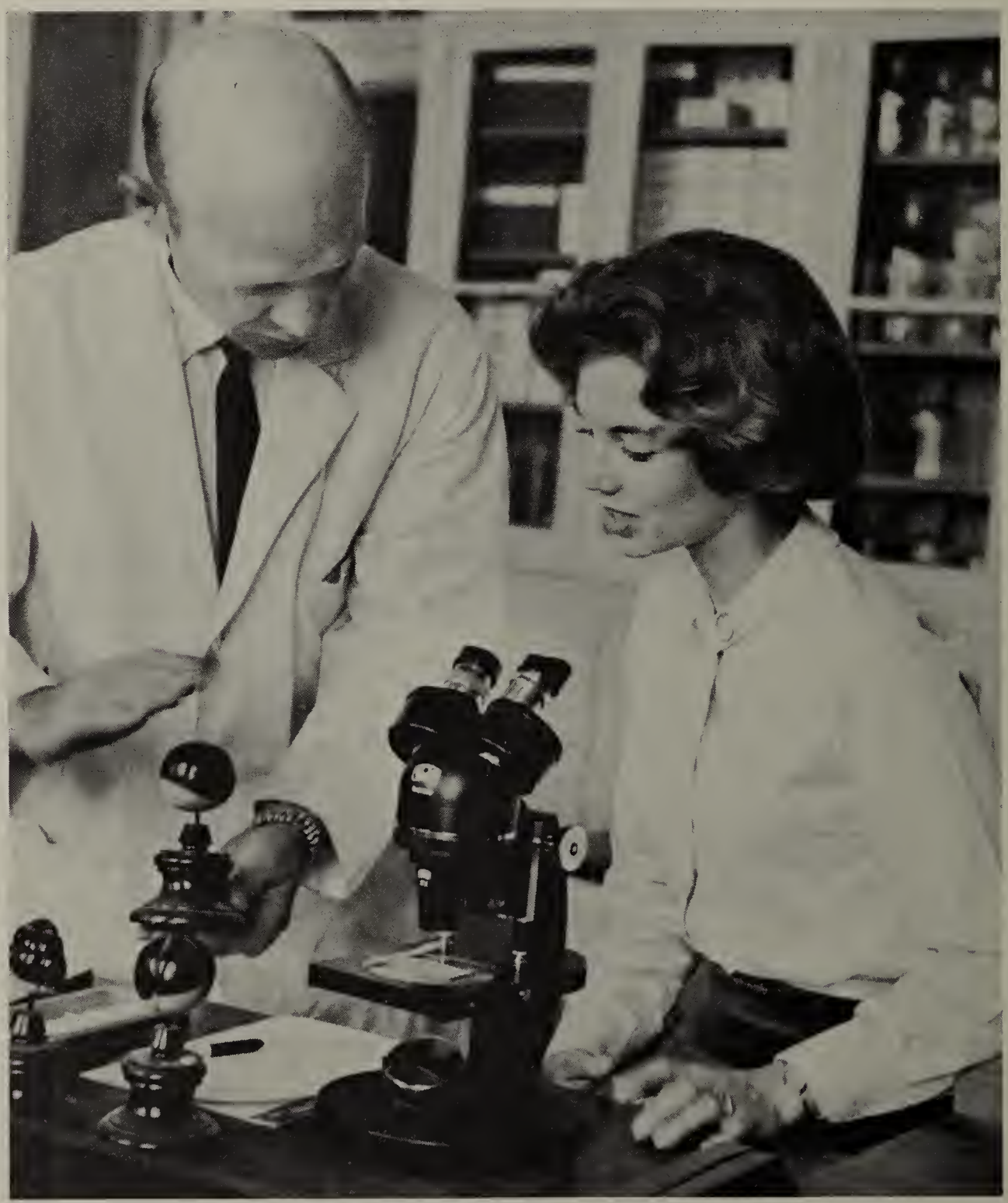
Graduate and professional programs are offered in Business Administration, Engineering, History, Education, Teacher Education, and Law.

SCHOOL OF SACRED THEOLOGY

Alma College, the school of theology of the California and Oregon Jesuit Provinces, is affiliated with the University as the University's School of Sacred Theology.

THE COLLEGE OF ARTS AND SCIENCES

Liberal education is the sort that "enables each man to think as well as his native powers permit." This liberal education is composed of experience in the humanities, mathematics, natural sciences, social sciences, philosophy, and theology, and is designed to provide general enlightenment about nature and man. Because this enlightenment is indispensable to a rich human life, the curriculum of the College of Arts and Sciences satisfies both the student certain of his or her future career choice and the student seeking a broad educational experience before making such a choice. For the former, the Arts and Sciences curriculum includes preparation for a variety of professional training and for graduate education.

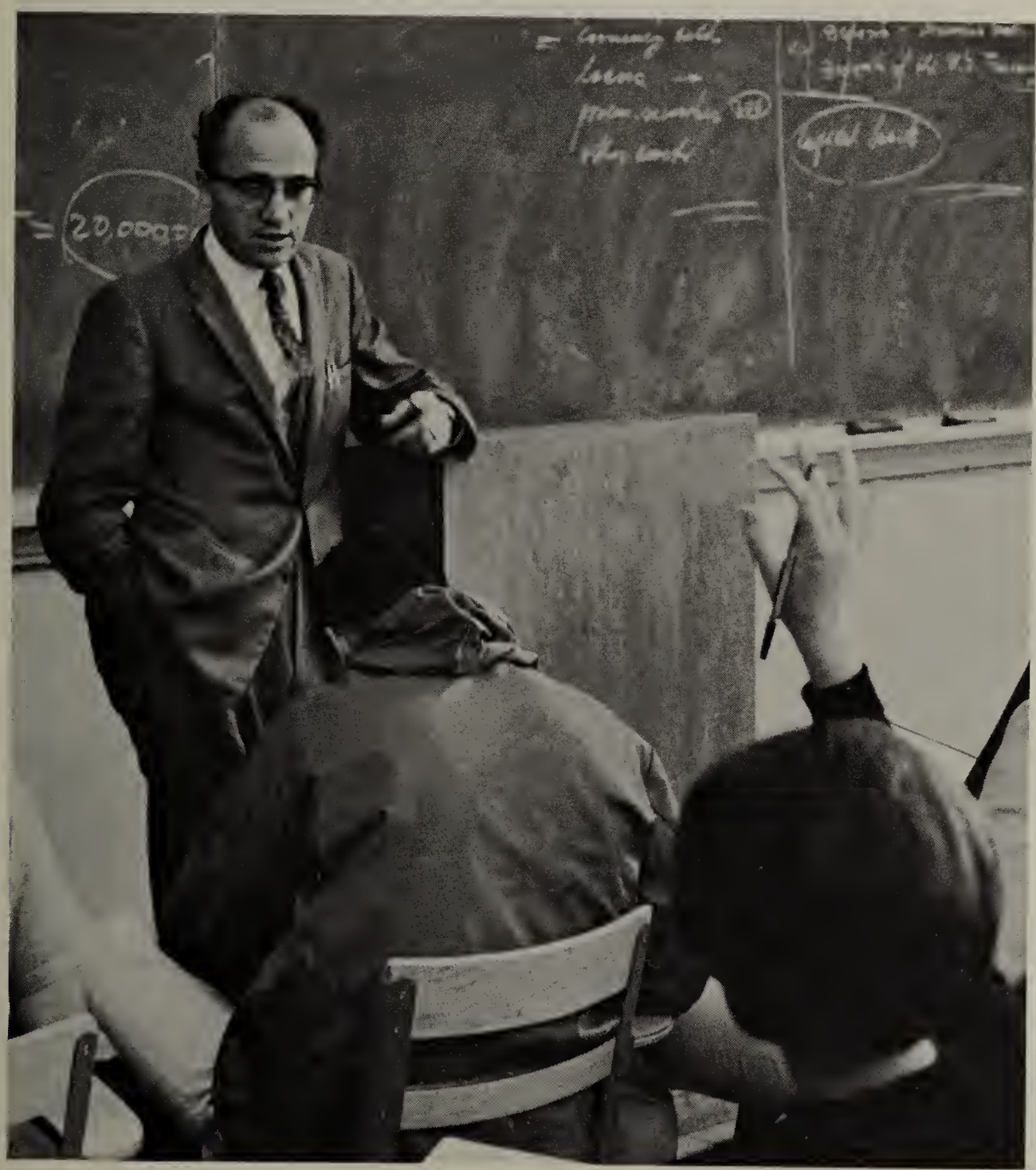


THE SCHOOL OF BUSINESS

The primary objective of the School of Business is to supply professional training for those who are aiming at responsible positions in corporations, their own business, professional organizations serving business, and governmental agencies.

Cases, problems, and discussions supplement the lecture method of instruction, and in the student's first two years, the fundamentals of English, mathematics, economics, accounting, speech, and philosophy prepare him to analyze and study the technical and special problems of business. During the junior and senior years, the program is arranged so that every student will include study in the major business functions.

Courses in ethics, philosophy, and science provide the student with the broad principles necessary for dealing with the industrial system in its social relationships.



THE SCHOOL OF ENGINEERING

Upon completion of an undergraduate program in Engineering, a wide range of opportunities exists in the profession of engineering. This vista is becoming increasingly broad because of the rapid expansion of technology in today's society, and the influence of technology on many activities in business and industry.

At Santa Clara, programs are available in civil engineering (relating to structural and sanitary works and works which have to do with water and transportation), mechanical engineering (concerned with propulsion, power generation, explosions of all types, heating, refrigeration and air conditioning, and structure subject to motion), and electrical engineering (design, construction, and operation of equipment for generation, transmission, and utilization of electrical energy).

Since its inception, the School of Engineering has felt that the undergraduate program primarily must include course work which is considered fundamental to all engineering with a minimum of specialization in the separate branches.

THE SCHOOL OF LAW

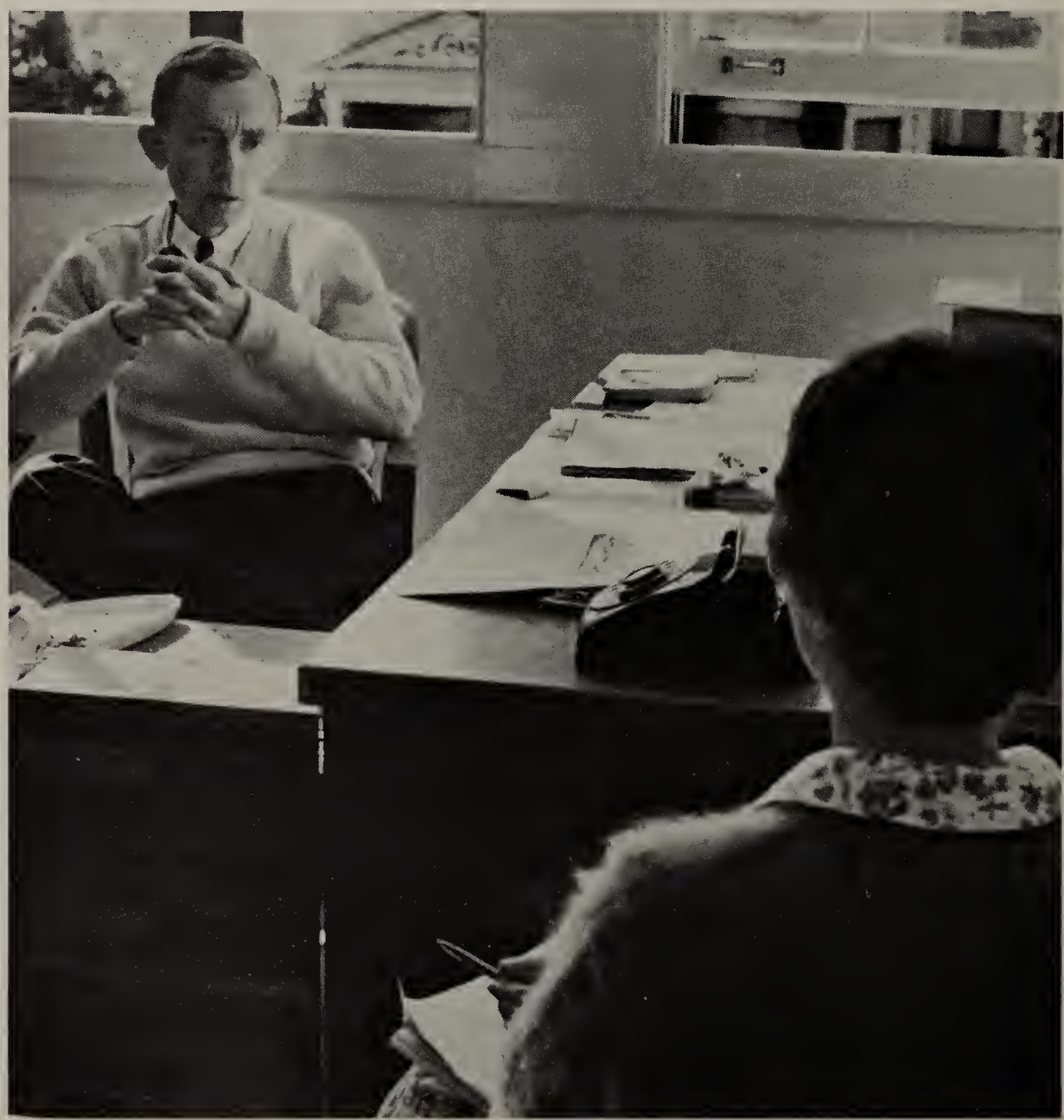
The University of Santa Clara Law School has as its objective the preparation of men and women for the legal profession. The program stresses the development of professional responsibility and the perfection of legal skills. This involves not only the acquisition of a working knowledge of the principles of law but also the training of the student to "think like a lawyer." A basic technique in this education is the case method, in which the student is confronted with actual problems in the law and is assisted in learning how to solve them in a systematic and professional way.

THE HONORS DIVISION

A university cannot fulfill its general obligation to all students unless it recognizes a particular obligation to its most talented students. The Honors Division seeks to meet this obligation: to set its students an extraordinary challenge in the areas and techniques of learning. The end of Honors is the dominant habitual engagement of the student's mind in science and wisdom; in understanding brought to bear on the human race, on the physical universe, and on the causes of both, reaching even to God.

Two kinds of degree programs are available to candidates in Honors: the degree in humanities, and a degree in one of the majors in Arts and Sciences.

Each Honors student may proceed at his own pace in mastering a given discipline, a pace set in semi-independent projects of reading and research, with professorial contact during these projects through tutorial interview.

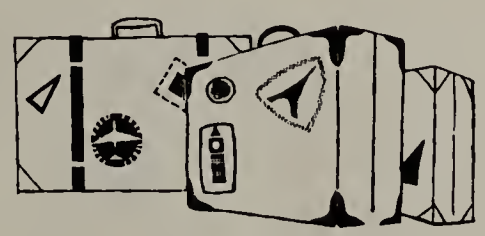


FOREIGN STUDIES

Because of many cultural and academic advantages, Santa Clara students are encouraged to spend their sophomore or junior year abroad. Because of its affiliation with the Institute of European Studies, our students may study at Freiburg, Madrid, Paris, or Vienna. Competence in the language and a B average are required to participate in this program. Santa Clara credit is given for work done at any of these campuses.

Also, superior students may attend several other centers, with individual approval of the students concerned.

To enroll in any of these programs, a student must receive the approval of the Campus Director of Study Abroad.



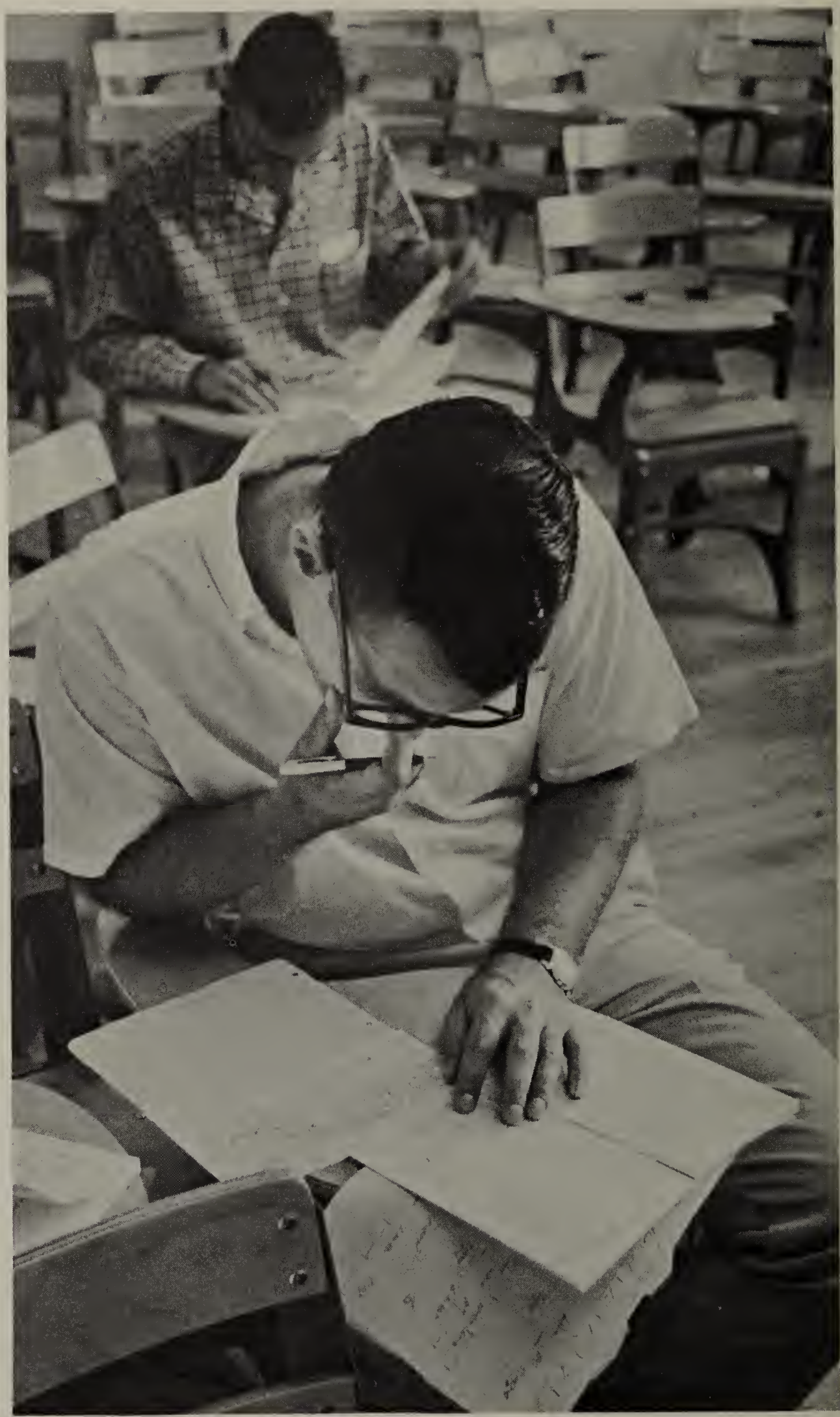
INFORMATION ON ADMISSIONS

Requirements

The following high-school courses are required of students applying for admission to the University as freshmen:

	Number of Units	
Course	*Arts and Business Majors*	*Science and Engineering Majors*
Algebra	1	2
English	3	3
History	1	1
One foreign language	2	2
Plane geometry	1	1
Laboratory science	1	2
Trigonometry	—	—½
Optional*	7	4½
Total	16	16

* *Optional courses must be in advanced foreign language, mathematics, laboratory science, or other solid college-preparatory courses.*



Admission Procedure

1. File your application and service fee of $5 with the Registrar, University of Santa Clara (application forms may be obtained from that office).
2. Submit recommendations, testifying to your scholastic ability and character, to the Registrar (recommendation forms are provided you with the application).
3. Request your high school to send a transcript of your work, after 3½ years of high school (spring semester of your senior year), to University of Santa Clara.
4. Take the Scholastic Aptitude Test of the College Entrance Examination Board and request that your test scores be sent to University of Santa Clara. Ask your school principal when and where to take College Boards.
   Note: In addition to the SAT, students applying for Chemistry, Physics, Mathematics, and Engineering must take achievement tests in Advanced Mathematics and in two of the following: Chemistry, Physics, English Composition.
5. *Make sure all of the above are completed and the required materials are in the hands of the Registrar no later than March 1.* This may seem very early for Fall entrance, but the pressure of an increasing number of applications makes it essential for effective processing. Besides, an otherwise well-qualified student should not run the risk of being refused admission merely because he filed too late.

Sixth-Semester Admission

Students who have earned a 3.5 out of 4.0 average in the first three years of high school may seek admission to the Colleges and Schools of the University after their sixth semester. Their application should be clearly identified and should include transcripts and three letters of recommendation. The decision concerning admission will be rendered immediately. It is requested that College Board scores be submitted in the normal manner for use in statistical studies. Students admitted after six semesters will not have to make the normal admissions deposit until March preceding September enrollment.

Advanced Placement

Advanced placement and college credit may be obtained by excellent scores on the College Board Advanced Placement Examinations. When these scores are received, the student will be notified of the placement and credit he will receive.

Admission of Foreign Students

Candidates for admission who come from foreign countries must present a score in the English Achievement Test of the College Entrance Examination Board. In order to be issued Immigration Form 1-20, applicant must be accepted as a full-time credit student working for a degree.

Admission to Advanced Standing *(Transfers)*

Admission to advanced standing is by specific action of the Committee on Academic Standing, which will evaluate all credits presented and determine the rating of the candidate. A student cannot be considered unless he is in good standing at the last college he attended. Good standing means he must have achieved at least an over-all C average.

Graduate Admissions

For information on admission to graduate work, write to the dean or the director of the graduate division, or School, involved.

Costs

Tuition and fees total $1,200 for the three-term academic year. Students who live on campus pay an additional $900 for meals and housing. Additional expenses of perhaps $300 a year would include books, laundry, and other essentials. The expenditures for clothing, social activities, transportation, and other needs are commensurate with the appetites of the individual. Specific University fees are tabulated in the appendix to this publication.

Financial Aids

Financial assistance at the University of Santa Clara is awarded on the basis of demonstrated leadership and character, superior academic record, and financial need. Assistance generally is categorized as scholarships, loans, deferred payment plans, and jobs.

Scholarships vary in amount from $200 to $2,000 and are renewable, provided the student fulfills the University's requirements and files for renewal each year. The stipend may be adjusted if the applicant's financial circumstances change substantially.

Students who are presently enrolled in an institution of higher learning, who wish to transfer to Santa Clara, and who need financial assistance should write to the Director of Financial Aids for instructions.

Loans

An incoming freshman student who wants a loan is encouraged to apply for a National Defense Student Loan Program loan which is explained in "Method of Payment." Santa Clara does not make loans to freshman students from its own funds.

Deferred Payment Plans

Santa Clara provides several types of deferred payment plans which are administered through outside agencies. One-, two-, three-, and four-year contracts are available.

Jobs

Employment during the school year is not encouraged; however, Santa Clara realizes that this is necessary in some cases. The University maintains a Placement Bureau on campus to assist students in securing part-time work.

Students who receive financial aid are expected to work during summer vacation. Men are expected to earn a minimum of $400 and women, a minimum of $300.

Applying for Aid

To qualify for scholarship consideration, a student must: (1) secure a copy of the Parents' Confidential Statement, a questionnaire on finances provided by the College Scholarship Service, have it completed and forwarded to the College Scholarship Service not later than February 15 (no other application for scholarship assistance is required); (2) arrange to take the Scholastic Aptitude Test of the College Entrance Examination Board in November, December, or January (California residents must take the test in November or December to qualify for a California State scholarship); (3) send the following to the University of Santa Clara by February 15: an application for admission with the $5 application fee, a transcript of high-school work for at least seven semesters, and three letters of recommendation from specified persons.

It is expected that all California residents will apply for State scholarships, if they intend to seek assistance at Santa Clara.

Applications for a National Defense Student Loan Program loan do not have to be filed until the scholarship awards have been announced.

Notification

All financial aid applicants will be notified of the disposition of their requests. Notification of scholarship awards will be made by May 1.

STUDENT LIFE

Membership in groups and participation in extracurricular life are encouraged as such activity can be a valuable adjunct to the education of the Santa Clara man or woman. Although freshmen should limit their activities somewhat, they will readily find clubs whose purposes will correspond to their interests.

The Associated Students plan and administer an extensive social program which ranges from class- and group-sponsored picnics to more formal dances in San Francisco's prominent hotels. The University's proximity to San Francisco allows it to bring the more famous personalities in the intellectual, cultural, and entertainment world to its campus.

Each student will find that the personal touch is very much a part of the Santa Clara tradition. Freshman Week is planned with the idea of helping new students to become familiar with the various phases of campus life. A large representation of upperclassmen will be on hand to meet with new students and to assist with the problems particular to incoming students. The Fall Homecoming Weekend, scheduled for early October, is not only a highlight of the social calendar but also serves as an excellent way for students to become acquainted with each other and with the alumni.

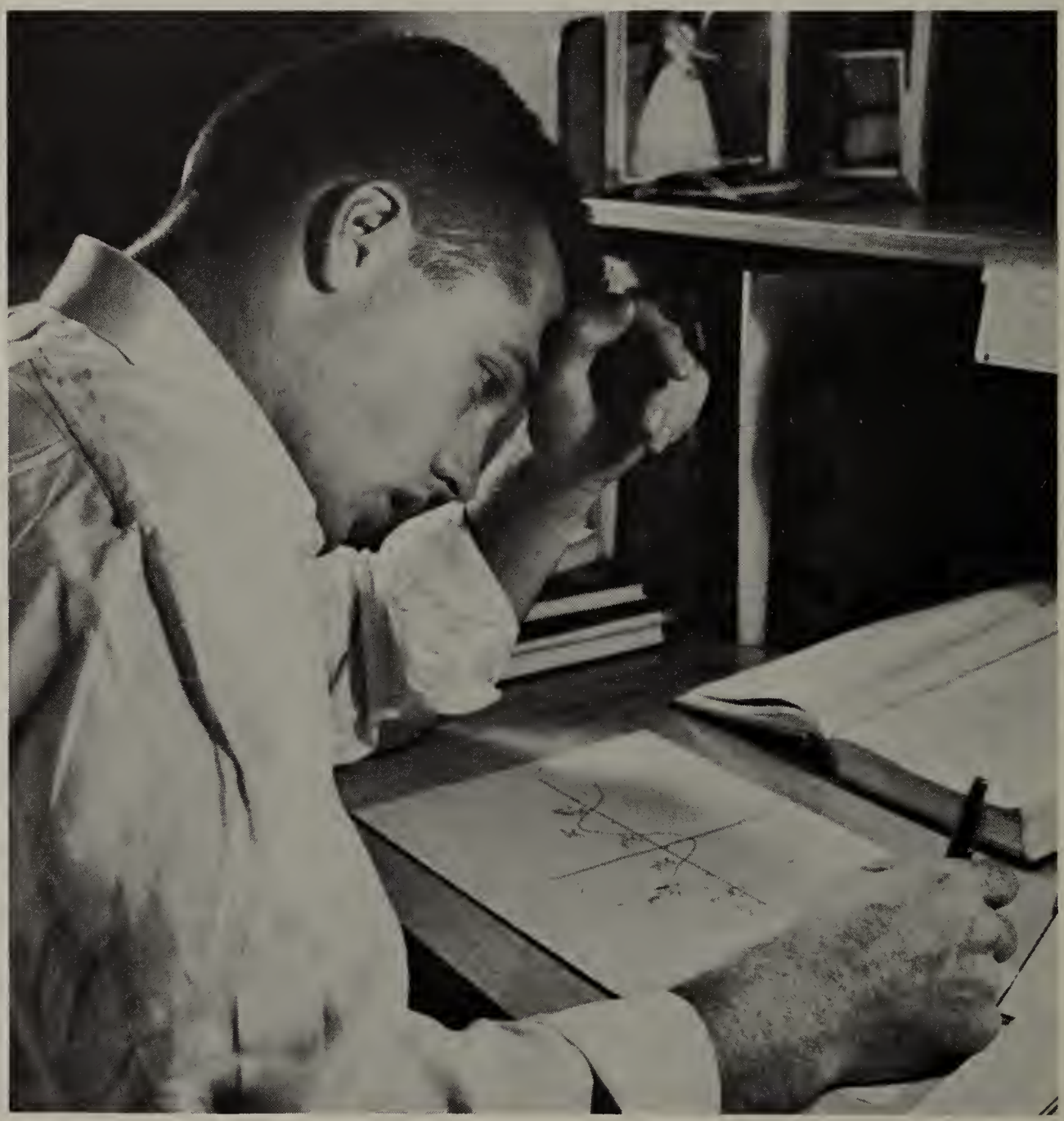
The personal approach does not end with Freshman Week, nor is it restricted to student relationships. Faculty seminars in dormitory lounges and informal get-togethers provide a relaxing medium for discussion and enjoyment.

The University feels an active cultural and social program is an essential part of the educative process. Accordingly, the Student Council and various organizations, under the supervision of the Dean of Men and the Dean of Women, execute an extensive and varied activities program.

The major intercollegiate sports are football, baseball, and basketball; tennis, water polo, golf, wrestling, soccer, and rugby are also played on this level. A full complement of intramural sports allows any student to participate.

The University maintains a program of recreational activities for women, under a Director of Women's Recreation. Golf, tennis, intramurals, swimming, bowling, and all active sports are included. Participation is open to all students according to interests and time limitations.

Although Santa Clara has grown rapidly in the last few years, it retains the family-type environment for which it is famous. This is a vital part of student life and an essential part of the University's particular kind of education.



STUDENT DISCIPLINE

The problem of discipline is a serious charge on the institution which both respects human rights and accepts the responsibility for guiding students to maturity. Many students are away from home for the first time in their lives; others are finding new horizons opening to them as their educational experiences broaden.

Since the University of Santa Clara believes in the dignity and importance of each person entrusted to its care, it accepts the responsibility of directing varied abilities and goals, guiding different personalities and interests, and understanding, and sometimes sharing, myriad student problems. The rules and regulations of the University are a means to an end and aid in the development of the student; they are not designed solely to restrict him.

Campus discipline is conducted under Student Government and is handled through the offices of the Dean of Men and the Dean of Women. Every effort is made to guarantee and protect student freedoms. The Student Court processes cases; an Advisory Board, made up of faculty members, students, and administrators, reviews Court findings. Through constant evaluation, new interpretations are developed in the light of democratic principles. The freedom to speak, to organize, to participate are rights guaranteed to all students — providing an environment of intellectual freedom.

STUDENT GOVERNMENT

The system of student government at Santa Clara makes the students themselves responsible for the conduct of student affairs.

Students organize and supervise religious, academic, cultural, and social activities through class governments, clubs, and committees. In the Student Senate, the students establish the rules and regulations and sanctions governing student activity in the residence halls, at athletic and social events, and at extracurricular events on campus. In the Student Court, students hear cases involving major violations of regulations and determine what sanctions are to be applied.

Student government at Santa Clara plays a vital role in the education of the students. As a genuine government of the students by the students, it develops responsibility and integrity in individual students.

GENERAL HOUSING INFORMATION

Acceptance to the University as an undergraduate automatically includes acceptance in a residence hall. All undergraduate students who do not live with parents or adult members of their families must live on campus. Housing deposit should be submitted as soon as acceptance notification has been received.

Room assignments are made by the Dean of Women and the Dean of Men. No single rooms are available. Freshmen will receive room assignments by mail in August. Sophomores, juniors, and seniors may request a specific hall and/or roommate, if they wish. These applications must be in writing and be received before July 15. Anyone who wishes a nonsmoker for a roommate should make this request to his Dean before July 15.

Rooms are provided with beds, pillows, mattresses, towel racks, bookcases, chairs, desks, chests of drawers, medicine chests, desk lamps. (A charge will be made for damage to rooms or furniture.)

Students must provide blankets (no electric blankets), sheets (six-foot contour sheets fit the beds), towels, pillowcases, washcloths, bedspreads.

Helpful extras could include a typewriter, an alarm clock, ash trays, a mending kit, and closet accessories, such as shoe racks.

Special service rooms are conveniently located in each building, with proper outlets for electric irons, hot plates, heaters, sun lamps, hair dryers, and such appliances, which are not permitted in the rooms. The University also maintains a laundry and dry-cleaning establishment on campus for the convenience of students. Television sets for student use are in various locations on campus.

COUNSELING SERVICES

A variety of counseling services are conveniently available to all students. The University Chaplain and his assistant provide religious guidance in personal interviews and during the University retreats. The deans of the College and Schools and the professors of the student's major department usually take care of the academic counseling of the students. The Director of the Testing and Guidance Center administers and interprets a wide variety of tests to assist the student in selecting a program and a career compatible with his abilities and interests. The assistance of qualified psychologists and psychiatrists is available when needed.

UNIVERSITY OF SANTA CLARA CALENDAR*
1964-1965

1964

SEPTEMBER

S	M	T	W	Th	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

OCTOBER

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NOVEMBER

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29	30					

DECEMBER

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1965

JANUARY

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24	25	26	27	28	29	30
31						

*All dates are inclusive dates.

Fall Quarter

Sept. 24-25: Freshmen Tests and Orientation.
Sept. 26: Freshmen Registration.
Sept. 28: General Registration (Sophomore, Junior, Senior, Law and Graduate Arts Students).
Sept. 29: Instruction begins.

Oct. 5: Last day of late registration and of adding courses.
Oct. 13: Last day for filing application for candidacy for the Master's degree to be conferred December 1964.
Oct. 23: Last day for seniors to file for candidacy for graduation in June 1965.
Oct. 27: Deficiency List due.

Nov. 26-27: Thanksgiving recess.
Nov. 30: Classes resume.

Dec. 1: Last day for filing with the Graduate Committee the final draft of theses for the Master's degree to be conferred in December 1964.
Dec. 8: Feast of the Immaculate Conception, academic and administrative holiday.
Dec. 11-16: Fall Quarter Examinations.

Dec. 17-Jan. 3: Christmas recess.
Dec. 21: Fall Quarter grades due.

Winter Quarter

Jan. 4: Classes resume. Beginning of Winter Quarter. Registration for new students.
Jan. 11: Last day for late registration and of adding courses.
Jan. 22: Last day for fulfilling language requirements for Master's degree.

UNIVERSITY OF SANTA CLARA CALENDAR*
1964-1965

1965

February

S	M	T	W	Th	F	S
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28						

Feb. 1: Deficiency list due.
Feb. 22: Washington's Birthday, academic and administrative holiday.
Feb. 26: Last day to file for LL.B. degree in June 1965.

March

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	1	2	3	4	5	6
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28	29	30	31			

March 8: Last day for filing candidacy for Master's degree to be conferred in June 1965.
March 15-18: Winter Quarter Exams.

March 19-28: Spring recess.
March 23: Winter Quarter grades due.

Spring Quarter

March 29: Classes resume for Spring Quarter. Registration for new students.

April

S	M	T	W	Th	F	S
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11	12	13	14	15	16	17
18	19	20	21	22	23	24
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April 5: Last day for late registration and adding courses.
April 16: Good Friday, an academic administrative holiday.
April 19: Classes resume.
April 21: Senior theses due.
April 23: Last day for filing with the Graduate Committee the final draft on theses for Master's degree to be conferred June 1965.
April 26: Deficiency list due.

May

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30	31					

May 20: Last day to file Undergraduate pre-registration forms for Fall Quarter 1965.
May 27: Ascension Thursday, academic and administrative holiday.

June

S	M	T	W	Th	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
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27	28	29	30			

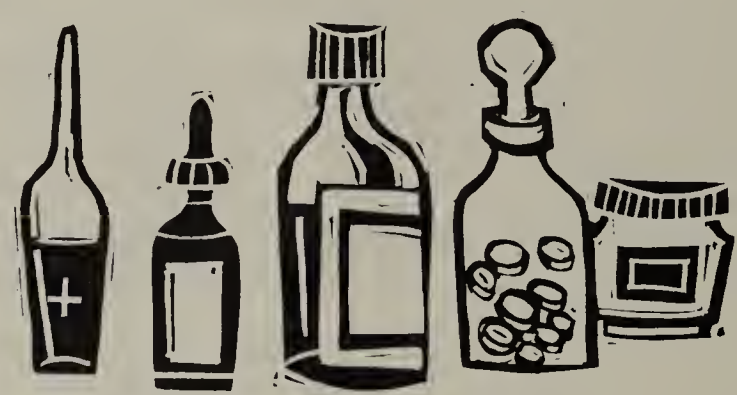
June 8-11: Spring Quarter Examinations.
June 12: 114th Commencement.
June 16: Spring Quarter grades due.
June 21: Summer Session begins.

*All dates are inclusive dates.

PLACEMENT BUREAU

The Placement Bureau, in the Benson Memorial Center, serves as a clearinghouse of information for seniors and maintains schedules of visits by business and governmental employment representatives. The schedules are distributed to all seniors, and a wide range of literature on career and job opportunities is available in the Placement Bureau for graduating students.

The Placement Bureau also assists students who wish to apply for part-time work during the school year and for vacation jobs. Students who desire such work during the school year should file their applications and qualifications at registration time.



STUDENT INFIRMARY

The Donohoe Infirmary is conveniently located near the center of the campus and is open from 8:00 to 6:00 p.m. weekdays. It is available in case of serious illness or emergency at any time; nurses are on duty around the clock. Arrangements for required off-campus hospital care are made through the Infirmary.

Dr. James B. Ludwig, head of the staff, has developed a program in accordance with the standards of the American Medical Association, and a panel of specialists in several areas of medicine will be on hand at various specified times and students may make appointments with them. An internist is on the floor from 8:00 a.m. to 12:00 noon, Monday through Friday.

There is no charge for visits to the Infirmary or for consultation with the physician, unless medication is required, and this is provided at nominal cost.

The University has a continuing relationship with O'Connor Hospital, a major facility operated by the Sisters of Charity and located less than three miles from the campus. In addition, innumerable other hospitals, both public and private, are located within several minutes' drive.

II

THE UNIVERSITY OF SANTA CLARA

COLLEGE OF ARTS AND SCIENCES

CATALOG · 1964-1965

SANTA CLARA · CALIFORNIA · 95053

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THE COLLEGE OF ARTS AND SCIENCES

ADMINISTRATIVE OFFICERS

Patrick A. Donohoe, S.J., Ph.D. . . . . President
Alexis I. Mei, S.J., Ph.D. . . . . Academic Vice President
Thomas D. Terry, S.J., Ph.D. . . . . Dean
John M. Hynes, S.J., A.M. . . . . Associate Dean
Director of Graduate Division

AIMS

The College of Arts and Sciences, as the oldest and central college of the University of Santa Clara, is responsible for the University's continuing commitment to Christian Humanism. Here, the student meets the intellectual, cultural, and moral forces of Western civilization. Philosophy and theology, the nucleus of that civilization, are the distinctive core of the College's program. History, literature and the arts, mathematics, and the social and natural sciences lay open to the student the many aspects of reality; philosophy and theology indicate ultimate aspects of reality.

The College seeks to arouse within its students an enthusiasm for gaining an insight into all these areas while achieving a special competence in one or two areas. With an able and demanding faculty the College assists the student in developing his powers of creative imagination, critical analysis, sound judgment, and effective expression. Although students and professors of all faiths are welcome within the College, the work of the College is a Christian liberal education. The goal of the College is Christian men and women with insight and skill, devoted to their fellowmen, their country, and their God.

UNDERGRADUATE COLLEGE

Entrance Requirements

High-school Courses

The following high-school courses are required of students applying for admission to the College of Arts and Sciences as freshmen:

Course	Units for A.B. Programs	Units for B.S. Programs
Algebra	1.0	2.0
English	3.0	3.0
History	1.0	1.0
One foreign language	2.0	2.0
Plane geometry	1.0	1.0
Laboratory science	1.0	2.0
Trigonometry	—	.5
Other college preparatory courses	7.0	4.5
Total	16.0	16.0

Grades of D cannot be accepted in fulfillment of the requirements for entrance to the College.

College Entrance Examination Board Tests

All candidates for admission must present scores from the Scholastic Aptitude Test of the College Entrance Examination Board. Candidates for admission as majors in Mathematics, Biology, Chemistry, and Physics must also present Achievement Test scores in advanced mathematics and two of the following: chemistry, English, and physics. It is recommended that these tests be taken no later than January preceding the desired date of entrance. Arrangements for these tests are made directly with the Educational Testing Service, 1947 Center Street, Berkeley, California 94704.

Advanced Standing

Admission to Advanced Standing (for transfer students) is by specific action of the Committee on Academic Standing, which will evaluate all credits presented and determine the standing of the student. No student will be considered unless he is in good standing at the last college he attended. Students from four-year colleges must have better than a C average for all courses. Students from junior colleges must have at least a grade-point average of 2.4 (A = 4) for all courses.

Advanced Placement

Advanced placement and college credit may be obtained by excellent scores on the College Board Advanced Placement Examinations. When these scores are received, the student will be notified what placement and credit he will receive.

Honors Division and Departmental Scholars Program

To qualify for admission to the College's two programs for outstanding students, the Honors Division and the Departmental Scholars Pro-

gram, the applicant must present a grade-point average of 3.5 for six high-school semesters and a total score of at least 1350 in the Scholastic Aptitude Test. Applicants for the Honors Division must, after presenting these credentials and the strong recommendation of counselors or instructors who have known them over a period of years, also be interviewed by the Director of the Division and his assistants – a tactic of inquiry aimed at a final evaluation of ability. Interviews are conducted in the Winter and the Spring in metropolitan centers throughout the United States. Students are informed by letter of the places and dates of the interviews. Applicants for the Departmental Scholars Program should apply for an interview with the chairman of their major department before or during Freshman Week. Applicants interested in the Honors Division write to the Director of the Division; those interested in the Departmental Scholars Program, to the Dean of the College.

Sixth-Semester Admission

Students who have earned a 3.5 out of 4.0 average in the first three years of high school may seek admission to the Colleges and Schools of the University after their sixth semester. Their applications should be clearly identified and include transcripts and three letters of recommendation. The decision concerning acceptance will be rendered immediately. It is requested that College Board scores be submitted in the normal manner for use in statistical studies. Students accepted after six semesters will not have to make the normal admissions deposit until March preceding September enrollment.

Degree Programs

Bachelor of Arts

The College of Arts and Sciences confers the degree of Bachelor of Arts in Economics, English, French, History, Philosophy, Political Science, Psychology, Pre-Legal Studies, Social Sciences, Sociology, and Theatre Arts.

Bachelor of Science

The College offers the degree of Bachelor of Science in Biology, Chemistry, Mathematics, and Physics.

The Honors Program

The Honors Program is offered by the Honors Division under the administration of a full-time director and his staff of full-time and part-time tutors and instructors. It is not a different major program set apart

from the programs listed above; students in the Honors Division may pursue any of the academic majors offered by the College of Arts and Sciences. A program in the humanities is currently in preparation.

It is in its methods of instruction and of learning that Honors provides an extraordinary challenge to the student. What is most unusual among these methods is the tutorial reading program begun at the outset of the freshman year and continued through the senior year (although elective in the junior year). The reading, and its concommitant two- and three-hour-a-week discussion with the tutor, is done in world classics chosen for their aptness for molding the student in ordered use of his intelligence.

Honors students, in their standard courses in the College, are enrolled also in reserved sections conducted in a combination of independent reading and seminar discussions. On occasion, visiting professors of renown provide special colloquia for the students of the Division.

Departmental Scholars Program

This is a special program provided by each department for the outstanding students majoring in the department. The aim of the program is to provide the student with an excellent preparation in his major field as well as with a rich background in other important areas. The program in each department is under the direction of the chairman.

The chairman guides the students through the preparation in their major field in special sections or in independent study and research. The special courses provided for Departmental Scholars are listed under the Courses of Instruction of the individual departments.

In the standard courses of the College, the students are enrolled in sections reserved for Departmental Scholars. A series of colloquia conducted by distinguished professors on the great issues of modern times brings together the Departmental Scholars of many departments for a broad discussion of these issues. These colloquia supplement the general education of the students and develop an insight into the responsibilities of educated men.

The Combined Degree

A combined degree, by which a student is allowed to substitute for his senior year in college the professional courses of the first year of study at the Santa Clara School of Law, is conferred by the College on students (a) who complete 33 courses, including Ethics, in the College; (b) who maintain not less than a B average in their junior year; and (c) who complete, with at least a C average, all the professional courses required in the first year in the School of Law. Such students will be awarded the Bachelor of Arts degree, or the Bachelor

of Science degree, in Pre-Legal Studies by the College of Arts and Sciences after they have completed their first year in the School of Law.

Other Programs

Pre-medical Program

Pre-medical programs which satisfy all the requirements prescribed by the Council of Education of the American Medical Association are offered by the Department of Biology and the Department of Chemistry. The curriculum is so arranged that the student may comply with the requirements for entrance to medical schools in three years. Medical schools, however, generally prefer that students spend four years in their preparation and include such cultural courses in their program as will better fit them for the practice of medicine.

Pre-dental Program

Pre-dental programs meeting all requirements for entrance into schools of dentistry are also offered by the Department of Biology and the Department of Chemistry.

Pre-legal Program

Pre-legal programs are not confined to any particular departments. However, since the emphasis in legal education is upon the development of the ability to analyze and synthesize, and to give clarity and conciseness to the expression of this ability, those undergraduate courses which advance this general development should be pursued. Subjects which lend themselves more to this growth than others are English, mathematics, philosophy, and the social and physical sciences. It is further recommended that all pre-legal students avail themselves of three years of college English, emphasizing expository and argumentative compositions, both written and oral.

Nursing Education

Nursing education for students of the O'Connor Hospital School of Nursing is provided, in part, by courses in the College of Arts and Sciences. These students are registered in the College and subject to all regulations governing the admission and matriculation of students. Though these students are not registered for a degree program in the College of Arts and Sciences, the credit earned is transferable and applicable to a college degree.

Pre-teaching Program

Preparation for prospective teachers is offered by the Department

of Education. The Department assists prospective teachers plan their undergraduate programs so as to include courses required by the secondary credential program.

Los Gatos Campus

Sacred Heart Novitiate is a branch campus of the College of Arts and Sciences of the University of Santa Clara. This campus is devoted exclusively to preparation for the priesthood of members of the Society of Jesus. The priesthood demands men well formed in asceticism and well educated in humanistic, scientific, philosophical, and theological studies. This campus offers the beginning of a twelve-year program. The first two years, the Novitiate, are concerned with the ascetical and religious formation of the novices, who also take courses in Latin, Greek, and speech. In the third and fourth years, the Juniorate, the scholastics study the liberal arts.

Graduation Requirements

General Graduation Requirements

The candidate for a degree must: (a) be in residence one year (3 terms) immediately preceding the date of graduation, (b) complete 42 courses with a C average or better, (c) satisfy the state requirement in "American History and Institutions" (see below), and (d) fulfill the requirements listed by his major department.

Graduation Requirements for the Bachelor of Arts Degree

Candidates for the degree of Bachelor of Arts must include in their program, in addition to the requirements of their major department, the following areas of study:

English: 3 courses, including English 1 and 2.

History: History of Western Civilization (History 4A and 4B).

American Institutions: 1 course from the following: Economics 116, History 17A, 17B, 174A, 174B, Political Science 1, 151A, 151B, 151C, 157A, 157B, 162, 172, 181.

Language: 4 courses in not more than two languages, including high-school work; the first two years of a language in high school are the equivalent of one course, and so is each subsequent year of the same language in high school.

Philosophy: 6 courses: History of Philosophy, Philosophy of Man, Metaphysics, Ethics (Philosophy 1, 2, 101, 102, 103), and an elective Philosophy course.

Physical Science: 2 courses; one course must be in a physical science, the second course may be in mathematics.

Social Science: 3 courses: two lower-division courses and one upper-division course from Economics, Political Science, Psychology, or Sociology.

Speech: 1 course.

Theology (Catholic students only): 5 courses: three lower-division courses (including Theology 5 and 6) and two upper-division courses.

Graduation Requirements for the Bachelor of Science Degree

Candidates for the degree of Bachelor of Science must include in their program, in addition to the requirements of their major department, the following areas of study:

English: 2 courses (English 1 and 2).

American Institutions: 1 course (see above).

Language: 2 courses in German, French, or Russian, including a reading examination of a technical journal in the major field.

Philosophy: 5 courses: History of Philosophy, Philosophy of Man, Metaphysics, and Ethics (Philosophy 1, 2, 101, 102, 103).

Social Science: 1 course from Economics, Political Science, Psychology, Sociology.

Speech: 1 course.

Theology (Catholic students only): 5 courses (see above).

GRADUATE DIVISION

Entrance Requirements

Bachelor's Degree

The applicant for admission to the Graduate Division must possess the Bachelor's degree or its equivalent from a recognized institution. To be admitted as a classified student to work for a graduate degree, the applicant must present a B average. To be admitted as an unclassified student to fulfill requirements for a secondary credential or to continue one's education, the applicant may be accepted with a somewhat lower average. Credit received by unclassified students is officially recorded and certified but is not applicable toward a graduate degree should the student later wish to become classified.

Application

A formal application is necessary for admission to the Graduate Division. Application forms may be obtained directly from the Registrar. The application forms, together with official transcripts of all previous college and university work, and the recommendation forms should be sent directly to the Registrar at least four weeks before the beginning of the term in which admission is requested.

Undergraduate Prerequisite

Ordinarily the prerequisite for the major subject is the equivalent of an undergraduate major, except in the case of the Master of Science in Teaching Mathematics degree (see below). The major department, after evaluating the undergraduate preparation, may prescribe undergraduate prerequisites for the graduate program.

Programs

Master's Degrees

The Graduate Division in Arts and Sciences confers the degree of Master of Arts in Education, in English, and in History. The Division confers a terminal degree Master of Science in Teaching Mathematics (M.S.T.M.), which is offered only to experienced teachers of mathematics in high school.

General Secondary Credential

The University of Santa Clara is accredited by the California State Board of Education to recommend qualified candidates for the California General Secondary Credential. Persons seeking this credential must first be admitted to the Graduate Division.

Course Requirements

The Master of Arts degree may be earned according to one of the two following plans. In Plan A, the student must complete, with a B average, 36 quarter-units of course work, write a thesis, and pass a comprehensive oral examination on the thesis and its background. In Plan B, the student must complete, with a B average, 45 quarter units of course work and pass two three-hour comprehensive examinations. In both cases the program must be unified and coordinated under the direction of the chairman of the major department.

The terminal degree of Master of Science in Teaching Mathematics may be earned by 45 quarter units of course work in addition to prerequisites. A combination of thesis and directed study may count for 9 quarter units.

Admission to Candidacy

It is the student's responsibility to apply for admission to candidacy. Application forms may be obtained from the Registrar. Before the application is accepted, the student must complete half of the course work with a satisfactory record and, where applicable, pass the modern language examination and submit an approved outline of his thesis. The University Calendar indicates the deadlines for submitting this application.

Thesis

The thesis must show thorough knowledge of the field and the capacity for original research, and it must be acceptable in literary style and format. The candidate is responsible for consulting the director appointed to guide him in the preparation of the thesis. When the thesis has been approved, the candidate must present two bound typewritten copies of it, one for the department and one for the library.

Re-examination

Students who fail a part of the comprehensive examination which is less than one-half of the total may be re-examined. Students who fail more than one-half of the examination may be failed simply, or may be re-examined at the end of the following term or summer. Students who delay more than a calendar year to take re-examinations become ineligible for the Master's degree.

Residence

The graduate student must devote at least one year or its equivalent

entirely to resident graduate study. However, a student who can give only part time to graduate work will not be allowed to complete the total course program in one year. The entire graduate program, exclusive of prerequisites, must be completed in five years.

Departmental Regulations

In addition to the general requirements listed above, the candidate is responsible for the requirements set down by his major department.

DEPARTMENTAL REQUIREMENTS

The departmental listings contain general information concerning the program of the department and the requirements for a degree in that field. These requirements should be carefully noted when deciding one's major.

Freshmen and sophomores, except those with Advanced Placement, are restricted to lower-division courses (numbered 1 to 99). Juniors and seniors are expected to have at least two-thirds of their program in upper-division courses (numbered 100 to 199). Only graduate students may take graduate courses (numbered 200 to 299).

The work in the Arts and Sciences undergraduate curriculum is measured in terms of courses. No credit is given for less than a full course. In the graduate curriculum, credit is given in quarter units. The course descriptions indicate where laboratory work is required. No special credit is given to laboratory work.

Credit by examination may be obtained according to the rules laid down in the section "Academic Requirements and Regulations," except for courses involving laboratory work and for courses containing *NCX* in their description.

DESCRIPTION OF COURSES

ARTS AND ARCHITECTURE

PHILIP B. WELCH, M. ARCH., R.A., *Chairman*

At the present time the University offers elective courses in the areas of art, architecture, ballet, theatre arts, and music. The stress in the Department is on the individual creative solution of the problem by sound professional techniques.

ARTS AND ARCHITECTURE COURSES (AA)

10. HISTORY AND ELEMENTS OF DESIGN I

A study of painting, sculpture, and architecture to develop informed and sensitive understanding of visual arts. Discussion, creative studio work, field trips. Fall term.

11. HISTORY AND ELEMENTS OF DESIGN II

Representation of space and form. Discussion of drawing, painting, sculpture, and abstract forms in historical context. Studio work in two- and three-dimensional design. Prerequisite: AA 10. Winter term.

12. HISTORY AND ELEMENTS OF DESIGN III

Correlation of material in all areas of creative arts and architecture. Discussions, creative studio work, field trips. Prerequisite: AA 11. Spring term.

20. DESIGN – SPATIAL

Simple architectural and sculptural problems. Discussion of methods, structure, and techniques in historical context. Studio exercises in creating form, structure, and space. Prerequisite: AA 12. Fall term.

21. SPACE DESIGN I

Relationship of space, form, light, and function in architecture and sculpture. Lectures, discussion, creative studio work, weekly seminar. Prerequisite: AA 20. Winter term.

22. SPACE DESIGN II

Organization of space, expression of the nature of materials. Architectural and sculptural techniques, history, aesthetics. Lectures, discussions, creative studio work, seminar. Prerequisite: AA 21. Spring term.

30. DESIGN – PAINTING AND DRAWING

Control of line, textures, values, color. Discussion of great historical examples. Studio exercises in drawing and painting as basis for creative expression. Prerequisite: AA 12. Fall term.

31. DRAWING AND PAINTING I

Development of painterly skills and creative approach. Lectures, discussions, studio work, visits to museums. Prerequisite: AA 30. Winter term.

32. DRAWING AND PAINTING II

Continuation of 31. Painting techniques, aesthetics. Weekly seminar on theoretical background for studio work. Prerequisite: AA 31. Spring term.

40. ELEMENTARY MODERN BALLET I

Basic ballet barré work, center work in "dry" form, with simple adage and port de bras. Improvisation to all kinds of music. History, aesthetics, discussion, films. Fall term.

41. ELEMENTARY MODERN BALLET II

Continuation of 40, allegro with linking steps and movements. Improvisation to all types of music. History, aesthetics, discussion, films. Prerequisite: AA 40. Winter term.

42. INTERMEDIATE MODERN BALLET I

Completion of barré work, simple combinations at barré and center. Improvisation to all types of music. History, aesthetics, discussion, films. Prerequisite: AA 41. Spring term.

90. DYNAMICS OF MOVEMENT

Coordination of muscular activities with rhythm, dynamics, space. Study of human body and relation to movement. For actors, instrumentalists, speakers. Lectures, studio work, films.

91. HISTORY OF DANCE

Survey of history of dance from primitive man through ancient, medieval, Asiatic, and modern dance. Relation to other fine arts, to religion. Discussion of history and techniques. Films.

99. INDIVIDUAL WORK

Advanced studio work or independent research for outstanding freshmen and sophomores. Prerequisite: Permission of Chairman of the Department.

143. INTERMEDIATE MODERN BALLET II

Continuation of 42, introduction of pointe work, development of more complex combinations at barré and center. Improvisation and individual projects. History, aesthetics. Films. Prerequisite: AA 42. Fall term.

144. ADVANCED MODERN BALLET I

Developed pointe work, more intricate combinations at barré and center. Improvisation and elementary choreographic expression.

History, aesthetics, special films. Cinema-ballet. Prerequisite: AA 143. Winter term.

145. ADVANCED MODERN BALLET II

Continuation of 144, more finished creative expression. Methods for teaching children, supervised teaching. Thesis on dance. Discussions of history and aesthetics. Prerequisite: AA 144. Spring term.

146. CHOREOGRAPHY

Music, projection, elements of choreographic expression, from basic spatial design to various group sizes. Literature, poetry, painting, etc., as basis for ballet creation. Prerequisites: AA 12, 91, 143.

150. MODERN ART.

Contemporary painting, sculpture, visual arts as reflections of modern life. Impressionism, expressionism, cubism, surrealism, new experiments. Visual study and discussion. Open only to Juniors and Seniors.

151. MODERN ARCHITECTURE

Architecture as an art form. From 1850 to present, including creative work of Paxton, Eiffel, Maillart, Van de Veld, Mackintosh, Sullivan, Wright, LeCorbusier, Saarinens, Goff. Open only to Juniors and Seniors.

152. CINEMA

Cinema as creative art form. Content and techniques from D. W. Griffith to Bergman, Kurosawa, Wells, Fellini, Ray, etc. History, aesthetics. Discussions, films. Open only to Juniors and Seniors.

199. INDIVIDUAL WORK

Advanced studio work or independent research for outstanding Juniors and Seniors. Prerequisite: permission of Chairman.

BIOLOGY

FRANCES R. FLAIM, PH.D., *Chairman*

The Department of Biology offers a flexible curriculum designed for students of differing interests. The work in this Department includes preparation for those students who elect postgraduate training in biology, medicine, or dentistry, and for those who wish to prepare for medical technology or teaching. In addition, two general Biology courses are offered for nonscience majors, designed to give an understanding of the interrelationship of plants, animals, and man.

Students who wish to make Biology their major subject are required to fulfill general requirements and complete the following for the Bachelor of Science degree:

1. Biology 5, 6, 32 (Biology 3 may be substituted with permission of the Department Chairman), Chemistry 1A, 1B, and 30A must be completed with at least a C grade before beginning any upper-division course in Biology.

2. Physics 2A, 2B must be completed with no less than a C grade. Attention is drawn to the fact that trigonometry is a prerequisite to Physics 2A.

3. Regardless of high-school language courses, two term courses must be taken in French, German, or Russian, and the student must be able to read a biological journal in the foreign language. However, if the student demonstrates the reading ability, the two term courses will be waived.

4. The major program must include a minimum of seven term courses of upper-division work in Biology chosen in consultation with the student's faculty adviser.

   a) A grade no lower than C must be earned in each course.

   b) Each candidate for a degree may be required to pass a comprehensive examination in his major field. This examination may be oral, written, or both and will be scheduled within the last six weeks of the senior year.

5. Chemistry 10, 30B are desirable for all and should be taken by those who plan professional studies in medicine, dentistry, medical technology, and biology.

6. Chemistry 140 is accepted for upper-division credit in Biology.

7. Biology 3 and 4 are recommended for student nurses; other students may be admitted with permission of the Chairman.

Students who maintain an over-all B average and no grade lower than B in science courses qualify as a Scholar in Biology. Any student who is accepted is eligible to elect Scholars sections of courses in other departments which have such sections available. He would also be eligible for Biology 195, Special Problems (independent research). In addition, if a student demonstrates competence in a particular field of biology, he may, with the Chairman's approval, carry out independent research in conjunction with regularly offered courses. The student will be responsible for the course content as well as the additional work he has chosen to undertake. Such a course will become a Scholars course and be so noted on his transcript.

BIOLOGY COURSES (BL)

2A. BASIC PRINCIPLES OF BIOLOGY

Comparative studies of the structure, function, heredity, evolution, and diversity of organisms. Laboratory. Fall and Winter terms.

2B. BASIC PRINCIPLES OF HUMAN BIOLOGY

A modern approach to man's structure, function, reproduction, and development; an examination of his role in nature. Laboratory. Winter and Spring terms.

3. MICROBIOLOGY

Survey of bacteria, fungi, viruses, rickettsiae, protozoa. Morphology, physiology, genetics of bacteria. Control of microbial populations. Cause and transmission of microbial diseases. Three hours laboratory. Winter term.

4. ANATOMY AND PHYSIOLOGY

Structure and function of cells, and organ systems. Laboratory: microscopic study of tissues, dissection of the cat, and elementary physiological experiments. Six hours laboratory. Fall term.

5. CELL BIOLOGY

Structure and function of cells. Cellular energetics, growth, and differentiation. Fine structure genetics. Three hours laboratory. Prerequisite: Chemistry 1A. Fall term.

6. INVERTEBRATE ZOOLOGY

Structure, function, development, and life histories of invertebrate animals. Six hours laboratory. Prerequisites: BL 5, 32 (or 3). Spring term.

32. GENERAL BOTANY

Basic principles of plant biology. The morphology, reproduction, and physiology of flowering plants. Three hours laboratory. Prerequisite: BL 5. Winter term.

101. VERTEBRATE ANATOMY

Comparative structure, organization, adaptation, classification. Six hours laboratory. Prerequisite: Upper-division standing in Biology. Fall term.

102. VERTEBRATE EMBRYOLOGY

Gametogenesis, fertilization, patterns of development to basic vertebrate plan, accessory membranes, organogenesis. Six hours laboratory. Prerequisite: Upper-division standing in Biology. Winter term.

104. HISTORY OF BIOLOGY AND SEMINAR

Development of the science of biology, its doctrines and hypotheses. Guided reading in modern biology. Prerequisite: Upper-division standing in Biology. Winter term. NCX.

107. GENERAL HISTOLOGY

Protoplasm, cell, basic tissue types, structure, and histogenesis. Basic histological technique. Six hours laboratory. Prerequisite: Upper-division standing in Biology. Winter term.

110. GENETICS

Basic principles governing inheritance in plants, animals, and man. Breeding of Drosophila and interpretation of results. Statistical studies of plant, animal, and human inheritance. Three hours laboratory. Prerequisite: Upper-division standing in Biology. Fall term.

111. GENERAL PHYSIOLOGY

Physiological systems of plant and animal cells. Interactions at the molecular, cellular, and organ level. Three hours laboratory. Prerequisite: Upper-division standing in Biology. Winter term.

113. GENERAL BACTERIOLOGY

Characteristics of microorganisms. Bacterial growth and death. Staining, media preparation, sterilization, disinfection, inoculation, identification. Pathogens emphasized. Five hours laboratory. Prerequisite: Upper-division standing in Biology. Winter term.

132. FIELD BOTANY

Field study of vascular plants, especially the seed plants of California; their identification, distribution, and ecology. Six hours laboratory. Prerequisite: Upper-division standing in Biology. Spring term.

156. GENERAL ECOLOGY

Plant and animal populations, habitats, relationships, and adaptations. Laboratory and field work: community analysis, measurements of physical factors. Six hours laboratory. Spring term.

195. SPECIAL PROBLEMS

Supervised investigation culminating with a written report suitable for publication. Prerequisite: Scholar in Biology or permission of the Department Chairman. Fall term. NCX.

CHEMISTRY

JOSEPH F. DECK, PH.D., *Chairman*

The curricula offered by the Department of Chemistry include two baccalaureate degrees: (1) Bachelor of Science in Chemistry (certified by the American Chemical Society), and (2) Bachelor of Science with a major in Chemistry.

BACHELOR OF SCIENCE IN CHEMISTRY (CERTIFIED)

This four-year curriculum provides graduates with the training necessary to enter work as chemists in various commercial and governmental laboratories or to transfer, upon graduation, to institutions offering advanced degrees in Chemistry. The American Chemical Society certifies that this degree meets all its recommended standards for the professional training of chemists. Students entering with deficiencies in high-school algebra, geometry, trigonometry, and chemistry are likely to experience difficulty in completing this program within four years.

REQUIREMENTS FOR BACHELOR OF SCIENCE IN CHEMISTRY (CERTIFIED)

Requirements in Major: Chemistry 1A, 1B, 10, 11, 30A and 30B; Chemistry 101, 110, 130, 135, 140, 150A, 150B, 150C.

Required Supporting Courses: Physics 4A, 4B, 4C; Mathematics 11, 12, 13; German 1, 2.

A grade of C must be maintained in each required Chemistry course or supporting course. A reading knowledge of German is also required, and the student must pass an examination in this language, administered by the Department of Chemistry, at the completion of the third term in the third year.

Students of superior ability who major in this Chemistry program may apply for admission to a Departmental Scholars Program. To be eligible for admission to this program a student must have achieved a grade of B in each of his science and mathematics courses during his previous year. Admission must be approved by the Department after application by the student.

The Departmental Scholars Program entitles the student to register in similar Scholars courses offered by other departments to satisfy general education requirements for graduation in the College of Arts and Sciences. A grade of B must be maintained in each course. Failure to maintain this grade will cancel privileges of enrollment in the more challenging program. A Departmental Scholar in Chemistry will also be required to complete a research thesis and to present it at the annual convention of the Student Affiliates of the American Chemical Society.

BACHELOR OF SCIENCE WITH A MAJOR IN CHEMISTRY

This four-year terminal program provides chemical training for those planning to obtain work of a broad technical nature, either in scientific laboratories or in fields allied to chemistry. This program will suffice for careers in patent law, library work, teaching, or businesses or industries having chemical products. High-school preparation should include algebra, geometry, trigonometry, and chemistry.

Requirements for Bachelor of Science with a Major in Chemistry

Requirements in Major: Chemistry 1A, 1B, 10, 11, 30A, 30B; Chemistry 101, 110, 130, 140, 150A, 150B.

Required Supporting Courses: Physics 2A, 2B; German 1, 2; Mathematics 11, 12.

Requirements in Minor: One additional upper-division course in a science other than Chemistry.

CHEMISTRY COURSES (CH)

1A. GENERAL CHEMISTRY

A comprehensive introduction to the principles and applica-

tions of chemistry. Illustrative problems. Quantitative determinations in laboratory exercises. Fall term.

1B. GENERAL CHEMISTRY

Continuation of 1A. Relationships of equilibrium systems in inorganic chemistry, both in theory and laboratory exercises. Systematic analysis of cations and anions in the laboratory. Prerequisite: CH 1A. Winter term.

2A. GENERAL CHEMISTRY

Elementary principles and properties of the more important elements and their compounds. Study of the more important chemical theories. For the nonprofessional student. Laboratory or demonstrations. Fall term.

2B. GENERAL CHEMISTRY

Continuation of 2A. Compounds of carbon; biochemical, industrial, and electrochemical discussions. Ionic equilibria and inorganic analysis. Prerequisite. CH 2A. Demonstration or laboratory. Winter term.

3A. GENERAL CHEMISTRY

Atomic and molecular structure. Quantum theory. Organic chemistry. Gases. Kinetic theory. Classical and quantum statistics. Ideal and real structure of solids. Problems. Fall term.

3B. GENERAL CHEMISTRY

Liquids. Solutions. Chemical energies. Equations. Oxidation and reduction. Electrochemistry. Rates of reaction. Chemical equilibrium and phase rule. Industrial processes. Laboratory work. Problems. Prerequisite: CH 3A or equivalent. Winter term.

10. ELEMENTARY QUANTITATIVE ANALYSIS

Theories and practice of acidimetry, alkalimetry, and volumetric precipitations. Introduction to gravimetric analysis. Brief introduction to theories of oxidimetry and reductimetry. Laboratory. Prerequisites: CH 1A, 1B. Spring term.

11. QUANTITATIVE ANALYSIS

Continuation of 10. Rigorous treatment of oxidation-reduction systems and laboratory exercises. Electroanalysis. Gravimetric determinations, organic precipitants. Colloidal theory. Laboratory. Prerequisite: CH 10. Spring term.

30A. ORGANIC CHEMISTRY

Aliphatic compounds. The properties and preparation of open-chain carbon compounds. Introduction to structural theories and mechanisms. Illustrative problems. Laboratory exercises in basic techniques and elementary syntheses. Prerequisites: CH 1A, 1B. Fall term.

30B. ORGANIC CHEMISTRY

Poly-functionals. Cyclic compounds. Introduction to carbohydrates and proteins. Aromatic hydrocarbons. Theories of colors and dyes. Brief introduction to heterocyclic compounds. Laboratory exercises. Prerequisite: CH 30A. Winter term.

101. ADVANCED INORGANIC CHEMISTRY

Basic atomic structure, valence, radioactivity, isotopes, and periodic law. Rare earths and transuranium elements. Synthetic inorganic chemistry. Laboratory. Prerequisites: CH 10, 30A, 30B. Fall term.

110. INSTRUMENTAL ANALYSIS

Principles and use of instruments. Potentiometric, conductometric, and amperometric titrations. Polarography, controlled cathode potential electrodeposition. pH measurements. Colorimetry, spectrophotometry, and emission spectrography. Laboratory. Prerequisites: CH 11, 30A, 30B, 150A, 150B. Winter term.

130. HETEROCYCLIC ORGANIC CHEMISTRY

Preparation and reactions of five- and six-membered rings with one heterocyclic atom. Brief introduction to other classes. Laboratory. Prerequisite: CH 30A, 30B. Fall term.

135. ADVANCED ORGANIC CHEMISTRY

Properties and reactivities of organic molecules as a function of molecular structure. Mechanism of reactions and rearrangements. Prerequisites: CH 30A, 30B. Spring term.

140. BIOCHEMISTRY

Carbohydrates, lipids, proteins. Constituents of blood and urine. Enzymes. Colloidal state, digestion, and biological oxidation. Prerequisites: CH 30A, 30B. Winter term.

150A. PHYSICAL CHEMISTRY

Fluids. Kinetic theory. Crystals. First, second, and third law of thermodynamics. Problems. Laboratory. Prerequisites: CH 11, 30, 30B; Mathematics 11, 12; Physics 4A, 4B, 4C. Fall term.

150B. PHYSICAL CHEMISTRY

Phase rule. Solutions. Chemical equilibrium and free energy. Chemical kinetics. Problems. Laboratory. Prerequisite: CH 150A. Winter term.

150C. PHYSICAL CHEMISTRY

Electrochemistry. Surfaces. Colloids. Quantum chemistry. Statistical mechanics. Advanced chemical kinetics. Problems. Laboratory. Prerequisite: CH 150B. Spring term.

ECONOMICS

MARIO L. BELOTTI, PH.D., *Chairman*

The Bachelor of Arts degree, with a major in Economics, is offered through the Social Science Division of the College of Arts and Sciences.

Students in the College of Arts and Sciences who wish to make Economics their major must fulfill all of the requirements of the College of Arts and Sciences and of the Social Science Division.

The following Economics courses are required of all students majoring in Economics:

Economics 1A. Economic Principles (Lower Division).
Economics 1B. Economic Principles (Lower Division)
Economics 110. History of Economic Thought (Upper Division).
Economics 114. Price Theory (Upper Division).
Economics 115. Aggregate Economic Theory (Upper Division).

A total of four upper-division Economics electives is needed to complete the requirements of the major.

ECONOMICS COURSES (EC)

1A-
1B. PRINCIPLES OF ECONOMICS

An introduction to general principles, terminology, and methods

of analysis essential to an understanding of modern economic processes and problems.

12. AMERICAN ECONOMIC HISTORY

A study of the economic history of the United States with special emphasis upon our basic economic organizations, such as the business enterprise, the labor union, and the economic functions of government.

15. RESOURCES AND INDUSTRIES

A study of the meaning, nature, and availability of resources and their relationship to human wants and social objectives.

110. HISTORY OF ECONOMIC THOUGHT

A study of the evolution of economic ideas and their influence on the development of economic practices.

111. MATHEMATICAL ECONOMICS

The formulation and evaluation of economic theories by the use of mathematical methods.

112. ECONOMETRICS

The application of mathematical and statistical methods to the analysis of economic data.

113. INDUSTRIAL ORGANIZATION

A microanalysis of the structure, conduct, and performance of American industry.

114. PRICE THEORY

The formulation and explanation of the theory of output, costs, and product prices and of the theory of the employment of and returns to the factors of production.

115. AGGREGATE ECONOMIC THEORY

An analysis of the level of national income and its determinants.

116. ECONOMIC DEVELOPMENT OF THE UNITED STATES

An analysis of the principal factors governing the growth and expansion of the American economy since 1800.

117. ECONOMIC DEVELOPMENT OF EUROPE

A study of the preindustrial environment and industrial growth patterns of the western European countries.

118. COMPARATIVE ECONOMIC SYSTEMS

A comparison of free market economies with partially and fully planned economies.

119. PUBLIC FINANCE

An analysis of public expenditures, public revenues, and public debt with particular emphasis upon their effects on the economy.

120. TAXATION

An analysis of the shifting, incidence, and economic effects of the various forms of taxation.

122. MONEY AND BANKING

A theoretical, institutional, and historical approach to the study of money and banking, with particular emphasis upon the relationship between the monetary and banking system and the rest of the economy.

128. BUSINESS FLUCTUATIONS

A study of the nature and causes of economic instability in an industrial economy.

129. ECONOMIC DEVELOPMENT

An analysis of the historical and theoretical context underlying present efforts to increase the rate of economic growth in underdeveloped countries.

150. LABOR ECONOMICS

A study of labor productivity, incomes, employment and how these are effected by labor organizations and labor legislation.

159. ECONOMICS OF ENTERPRISE

An analysis of cost and price relationships in the individual firm, in the industry, and in the economy.

180. INTERNATIONAL ECONOMICS

An analysis of the theory of international trade, of problems in balance of payments adjustments, and of international policies.

Graduate Courses

(Open to Graduate Students Only)

213. ECONOMIC PRINCIPLES (3)

A review of basic economic principles concerned with pricings and the level of output.

214. ECONOMIC ANALYSIS OF THE FIRM (3)

An advanced analysis of the application of economic theory to the formulation of business policies and plans. Prerequisite: 213 or equivalent.

215. ANALYSIS OF BUSINESS CONDITIONS (3)

An advance analysis of aggregate economic theory with particular emphasis upon economic forces which influence the level of business activity. Prerequisite: 213 or equivalent.

216. MACRODYNAMICS (3)

An analysis of the fundamental factors responsible for economic fluctuations and growth together with a study of tools and techniques of measuring and forecasting business changes. Prerequisite: 215.

217. ECONOMIC POLICY (3)

An advanced analysis of public policies designed to affect the size, the composition, and the distribution of the nation's wealth and income. Prerequisites: 214 and 215.

Seminars

210. SEMINAR IN THE DEVELOPMENT OF ECONOMIC THOUGHT (3)

211. SEMINAR IN MATHEMATICAL ECONOMICS (3)

212. SEMINAR IN ECONOMETRICS (3)

218. SEMINAR IN AGGREGATE ECONOMICS (3)

219. SEMINAR IN INDUSTRIAL ORGANIZATION (3)

228. SEMINAR IN MONETARY THEORY (3)

229. SEMINAR IN ECONOMIC DEVELOPMENT (3)

288. SEMINAR IN INTERNATIONAL ECONOMICS (3)

Prerequisite for all seminars: see course announcement.

EDUCATION

GERALD E. MCDONALD, ED.D., *Chairman*

PRE-TEACHING PROGRAM

Students who wish to enter the teaching profession should enroll in the Pre-Teaching Program established by the Department of Education with the cooperation of several departments in the College of Arts and Sciences. Curricula for prospective teachers are available in the offices of the Department.

Freshmen who would elect teaching as a profession are urged to attend the orientation lectures and the seminars provided by the Department of Education.

TEACHER EDUCATION PROGRAM

The University of Santa Clara is accredited by the California State Board of Education to recommend qualified candidates for the credential to teach in secondary schools. Persons seeking this credential must first be admitted to the Graduate Division of the University in the prescribed manner. The Committee on Teacher Education will then act on the application.

The profession of teaching requires liberally educated persons who possess both professional competence and specialized knowledge and skill in the areas to be taught. The undergraduate preparation of teachers should include a broad general education. In his undergraduate years, also, the prospective teacher should develop a teaching major and minor and begin his study of professional education. The prospective candidate for the credential should consult with the Director of Teacher Education for approval of his study program. He must spend a postgraduate academic year at the University, during which he completes a full schedule of work with a grade-point average of 2.75.

The candidate for the teaching credential must complete the following courses in professional education, or other acceptable units: Education 108, 111, 119, 207, 208, and 320A-B. A student will not be permitted to enroll in Education 320A-B, Directed Teaching, until he has satisfactorily completed at least one term of residence under the supervision of the Department of Education.

In the selection of students seeking to prepare for a credential, the Committee on Teacher Education will consider character, aptitude, physical and mental health, citizenship, and the quality and pattern of academic preparation.

MASTER OF ARTS PROGRAM

The Master of Arts in Education is designed as a professional degree for school personnel in the fields of secondary school teaching and pupil personnel services. Forty-five quarter units of selected upper-division and graduate work are required. As graduate preparation, distinct from a state teaching credential, the master's program provides for a concentration in the candidate's teaching field and a specified core of three graduate courses in professional education. For those who would elect the field of pupil personnel services, the program calls for a professional training that is exclusively graduate in character.

PREREQUISITES

Prerequisites to the Master's degree in teaching are (1) a Bachelor's degree or the equivalent from a recognized institution of learning, and (2) a state teaching credential or acceptance into the University's Secondary Credential Program.

Those seeking the Master's degree in pupil personnel services for positions in public education should be state-certified teachers possessing evidence of successful teaching in an elementary or secondary school. Adaptations will be made for those whose professional goals are different. Education 108, 111, and 119, or their equivalent, are prerequisite courses in education.

Core Program

For the programs in teaching and pupil personnel services, the following are required: ED 218, Psychology of Development; ED 220, Educational Research; and ED 275, Philosophic Foundations of Education.

Course Programs

Secondary-School Teaching:

Candidates for the Master of Arts degree in Education may concentrate in the teaching fields of English and History. Excepting the core requirement, course work in professional education or the teaching field should be selected according to need.

Pupil Personnel Services:

The following courses are offered for candidates who elect the field of pupil personnel services, ED 217, ED 219, ED 226, ED 227, ED 300, ED 301, ED 307, ED 309, and ED 330. Remaining course work may be selected according to need. A grade of B is required in ED 227, ED 309, and ED 330.

108. HISTORY OF EDUCATION

The growth of American public education. The secondary school. The influence of leading educators. Major educational trends.

110. RATIO STUDIORUM

An examination of the principles, methods, and practices observed in the schools of the Society of Jesus, as embodied in the Ratio Studiorum. Comparison with current educational theory and practice. Given on Los Gatos campus only.

111. PHILOSOPHY OF EDUCATION

A survey of principles, philosophy, and theory of education affecting present day procedure. Prerequisite: ED 108. NCX.

119. PSYCHOLOGY OF ADOLESCENCE

Physical, mental, and moral changes occurring during the adolescent period. Development of the attitudes, interests, and problems of the teenage period. Practical application of psychological principles of learning. Prerequisite: ED 108. NCX.

Graduate Courses

207. AMERICAN SECONDARY SCHOOLS (5)

Organization and curriculum of the modern American secondary school. Extensive directed observation in local schools.

208. CURRICULUM AND INSTRUCTION IN SECONDARY SCHOOLS (5)

Techniques of selecting and organizing content, of instructing pupils, of using instructional materials, and of evaluating pupil learning.

217. ADVANCED EDUCATIONAL PSYCHOLOGY (3)

Critical examination and evaluation of learning theories in educational psychology.

218. PSYCHOLOGY OF DEVELOPMENT (3)

Advanced study of the bodily processes and personality development from childhood through adolescence.

219. GROUP PSYCHOLOGY (3)

The role of small groups in the educational environment. Social and psychological factors in the etiology and control of group

behavior. Communication as a sociopsychological and cultural process.

220. EDUCATIONAL RESEARCH (4)

Methods, techniques, and reporting of educational research.

226. PRINCIPLES AND PROCEDURES IN GUIDANCE (3)

Development of pupil personnel services, concepts, and procedures. Staff roles and functions, community resources, professional ethics, and legal aspects.

227. COUNSELING PROCESS AND PROBLEMS (4)

Educational, vocational, and personal guidance, case conference, techniques, systematic study of cases with presentation of findings to the class.

275. PHILOSOPHIC BACKGROUNDS OF EDUCATION (3)

Comparative philosophies of education and their historical backgrounds.

300. OCCUPATIONAL INFORMATION AND PLACEMENT (4)

Educational and vocational information, planning, and placement. Occupational choice, occupational trends, and work experience programs.

301. ORGANIZATION AND ADMINISTRATION OF GUIDANCE (3)

Methods of implementing and evaluating a guidance program. Problems of relating guidance services to the total curriculum of the school.

307. MEASUREMENT FOR GUIDANCE (3)

Theory and practice of standardized testing procedures; the applications and limitations of standardized tests; elementary statistical procedures; techniques of administering group tests.

309. SEMINAR IN GUIDANCE AND COUNSELING (4)

Survey of recent research concerning trends, problems, and significant issues in guidance and counseling. Presentation of papers together with seminar discussions.

320A. DIRECTED TEACHING (6)

Participation and practice, under supervision, in conducting classes in public high schools. Conferences with supervising instructors and with the Director of Teacher Education.

320B. DIRECTED TEACHING (6)

Participation and practice, under supervision, in conducting classes in public high schools. Conferences with supervising instructors and with the Director of Teacher Education.

330. COUNSELING PRACTICUM (8)

An internship program to include supervised experiences in educational, vocational, and personal guidance. Use of counseling procedures for the age level at which the student is preparing to counsel.

ENGLISH

JOHN H. GRAY, S.J., PH.D., *Chairman*

DEGREE REQUIREMENTS

BACHELOR OF ARTS

Students who wish to make English their major subject must complete eleven courses in the Department with an average grade of C. The four lower-division courses must include English 1, English 2 or 43, and two courses chosen from English 46, 47, 48. The seven courses in the junior and senior years must include Chaucer (152) and

- two courses in Shakespeare (116, 117, 118),
- one course in Renaissance literature (114, 155, 156, 157, 158),
- one course in post-Renaissance literature (115, 120, 121, 122, 130, 131),
- one course in the novel (125, 126, 127), and
- one course selected from any of the upper-division courses offered by the Department, or, with approval, from allied courses (e.g., dramatic or foreign literature) given in other departments.

Course Prerequisites

A Bachelor's degree with an undergraduate major in English is the ordinary prerequisite to study for the Master's degree. However, a candidate may be accepted if he presents at least six upper-division courses which include a course in Chaucer, a course in Shakespeare, two period-survey courses from the following: Age of Milton, Renaissance Period, Neo-Classical Period, Romantic Period, Modern British Literature, or the Medieval Period. A candidate presenting courses other than these may fulfill these requirements while enrolled in graduate school; they will be counted as part of the thirty-six (or forty-five) units leading to the Master's degree in English.

Modern Language Examinations

Before advancement to candidacy, applicants for the Master's degree must pass a written examination to establish their reading ability in either French or German. These examinations are administered by the Department of English on dates indicated on the University calendar. With the consent of the Chairman, and where the proposed field of study justifies it, another modern language may be substituted.

Required Courses

One course in Old English (EN 211) and one course in Middle English (EN 213) are required of all candidates and will be offered in regular rotation.

Graduate Course Credit

All graduate courses are three-hour courses evaluated at three quarter units. Since seminars will include intensive studies of different authors each time they are offered, they may be taken for credit any number of times. Other courses, however, may not be repeated for credit.

ENGLISH COURSES (EN)

A. REMEDIAL ENGLISH

Required of students who fail composition placement tests. Successful completion of this course is a prerequisite for admission to any course in the Department. No credit. Fall term.

B. REMEDIAL READING

Recommended for students who score poorly in the reading comprehension placement tests. No credit. Fall term.

C. RAPID READING

Recommended for students who need to improve their ability to read rapidly with maximum comprehension. No credit. Winter and Spring terms.

1. COMPOSITION

Expository, argumentative, persuasive, descriptive, narrative writing. Emphasis on logic of rhetoric. Fall and Winter terms.

2. INTRODUCTION TO LITERATURE

Theory of literature, principles of critical analysis, readings in poetry and drama. Emphasis on written expression. Winter and Spring terms.

5. LITERARY CRITICISM

The reading of outstanding imaginative works in English and American literature to introduce the student to basic problems of aesthetics and poetics, and to make the student aware of his reading and writing deficiencies. Restricted to Honors freshmen. Fall term.

6. READING AND WRITING LABORATORY

Course aims at sensitizing students to language and style by individually directed reading and writing. Student's writing in various courses will be reviewed and appropriate tasks of revision and study assigned. Restricted to Honors freshmen. Winter term.

10. JOURNALISM

Theory and practice of reporting, editing, headline composition, type selection, layout, and design. Spring term.

15. WORLD DRAMA

Selected readings in dramatic literature from the Greeks to the moderns. Elective for non-English majors. Spring term.

16. FICTION

Readings in the short story and novel. Elective for non-English majors. Winter term.

20. BUSINESS COMMUNICATIONS

Theory and practice of effective written expression in the business world. Designed for students in the College of Business. Fall, Winter, and Spring terms.

30. AMERICAN CLASSICS

Selected readings in American literature for non-English majors. Spring term.

43. POETRY

Mechanics and structure of poetry. Designed as an alternate to EN 2. Restricted. Permission of Department required. Spring term.

46. SURVEY OF ENGLISH LITERATURE I

Readings in the history of English literature from the beginnings to 1660. Restricted to English majors. Fall term.

47. SURVEY OF ENGLISH LITERATURE II

Readings in the history of English literature from 1660 to 1832. Same restriction as for EN 46. Winter term.

48. SURVEY OF ENGLISH LITERATURE III

Readings in the history of English literature from 1832 to the present. Same restriction as for EN 46. Spring term.

49. ENGLISH CLASSICS

Selected readings in English literature for the non-English major. Spring term.

100. LITERARY CRITICISM

Theory, history, and practice of literary analysis and evaluation. Readings in the major critics. Fall term.

110. THE ENGLISH LANGUAGE

History of origins and development of English as written and spoken in England and America. Spring term. Alternate years.

114. THE ENGLISH DRAMA I

The history of the drama in England from the beginnings to 1642. Emphasis on Marlowe, Chapman, Jonson, and Webster. Winter term. Alternate years.

115. THE ENGLISH DRAMA II

The history of the drama in England from 1660 to the present. Emphasis on Dryden, Congreve, Sheridan, Wilde, and Shaw. Spring term. Alternate years.

116. SHAKESPEARE'S TRAGEDIES

Intensive study of Shakespeare's major tragedies; attention to the various critical approaches to Shakespearean drama. Fall term.

117. SHAKESPEARE'S COMEDIES

Intensive study of Shakespeare's major festive and problem comedies, with an analysis of the changing concepts of comedy and romance. Winter term.

118. SHAKESPEARE'S HISTORIES AND SONNETS

An intensive study of the *Richard II*-to-*Henry V* cycle of chronicle plays, with an introduction to the problems of the sonnets. Spring term.

120. THE NEO-CLASSICAL PERIOD

A study of the nondramatic literature of England from 1660 to 1798. Spring term. Alternate years.

121. THE ROMANTIC PERIOD

A study of the nondramatic literature of England from 1798 to 1832. Emphasis on poetry. Winter term. Alternate years.

122. THE VICTORIAN PERIOD

A study of the nondramatic literature of England from 1832 to 1900. Fall term.

125. THE ENGLISH NOVEL

A study of the origins and development of the novel in England from Defoe to Conrad. Winter term.

126. THE AMERICAN NOVEL

A study of the development of the novel in America from the beginnings to Faulkner. Fall term.

127. THE MODERN NOVEL

A study of recent theories and techniques in novel writing. From Flaubert to the present. Spring term.

130. MAJOR AMERICAN WRITERS I

A study of the writings of the major American authors up to the twentieth century. Winter term.

131. MAJOR AMERICAN WRITERS II

A study of the writings of the major American authors in the twentieth century. Spring term.

144. COMPARATIVE LITERATURE I

A study of classical forms, themes, and stylistic devices and their

specific influence and effect on English literature. Fall term. Alternate years.

145. COMPARATIVE LITERATURE II

A study of the major forms and themes of modern continental literature and their influence on English literature. The differences between English and Continental literature. Winter term. Alternate years.

147. TWENTIETH CENTURY FICTION: JAMES JOYCE

Intensive analysis, interpretation, and criticism of the major narrative works of Joyce, using contextual, historical, comparative, and biographical methods. Open to upper-division students by petition to the Honors Division.

148. TWENTIETH CENTURY FICTION: MARCEL PROUST

Intensive analysis, interpretation, and criticism of the major narrative works of Proust, using contextual, historical, comparative, and biographical methods. Open to upper-division students by petition to the Honors Division.

149. TWENTIETH CENTURY FICTION: THOMAS MANN

Intensive analysis, interpretation, and criticism of the major narrative works of Mann, using contextual, historical, comparative, and biographical methods. Open to upper-division students by petition to the Honors Division.

152. CHAUCER

A study of the major works of Geoffrey Chaucer in the Middle English language. Emphasis on the literary value of *The Canterbury Tales*. Fall and Winter terms.

155. THE MEDIEVAL PERIOD

A study in translation of the major genres of literature in England, from the beginnings to 1485. Fall term. Alternate years.

156. THE RENAISSANCE

A study of the nondramatic literature of England from 1485 to 1603. Fall term. Alternate years.

157. THE SEVENTEENTH CENTURY

A study of the nondramatic literature of England from 1603 to 1700. Winter term. Alternate years.

158. MILTON

A study of the major writings of John Milton, with emphasis on *Paradise Lost*. Spring term. Alternate years.

160. MODERN ENGLISH LITERATURE

A study of the nondramatic literature of England from 1900 to the present. Spring term. Alternate years.

165. MYTHOLOGY

A study of the nature and function of mythology and its influence on the literary tradition up to the present. Spring term. Alternate years.

171. CREATIVE WRITING I

A laboratory course designed to give the student personal instruction and direction. Restricted. Permission of instructor required. Winter term.

172. CREATIVE WRITING II

A continuation of English 171, which is not, however, a prerequisite. Same restriction. Spring term.

201. SEMINAR IN POETRY (3)

202. SEMINAR IN CRITICISM (3)

203. SEMINAR IN DRAMA (3)

210. LINGUISTICS (3)

A study of structural linguistics with an historical survey of traditional parts of speech and syntax. May be substituted for English 211 or 213.

211. OLD ENGLISH (3)

A study of the language and literature of the Old English period. Required. Fall term. Alternate years.

213. MIDDLE ENGLISH (3)

A study of the language and literature of the Middle English period. Required. Winter term. Alternate years.

216. SEMINAR IN SHAKESPEARE (3)

220. SEMINAR IN NEO-CLASSICAL LITERATURE (3)

221. SEMINAR IN ROMANTIC LITERATURE (3)

222. SEMINAR IN VICTORIAN LITERATURE (3)

230. SEMINAR IN AMERICAN LITERATURE (3)

252. SEMINAR IN CHAUCER (3)

255. SEMINAR IN MEDIEVAL LITERATURE (3)

256. SEMINAR IN RENAISSANCE LITERATURE (3)

260. SEMINAR IN MODERN ENGLISH LITERATURE (3)

280. DEVELOPMENTAL READING (3)

A study of the methods of instruction in remedial and rapid reading courses. Designed especially for secondary school teachers. Winter term.

EUROPEAN LITERATURE IN TRANSLATION

European Literature in Translation is offered to develop a coherent synthesis of understanding of our culture through a study of the great ideas in European literature. An attempt is made to give the student a unitary discipline and synthetic understanding of the wisdom of our Western Civilization with a view to illuminating the problems and crises of our age. The specific aim is to reclarify the de facto communion of religion and culture in Western Civilization. There is no language prerequisite for these courses.

EUROPEAN LITERATURE COURSES (EL)

111. EUROPEAN LITERATURE I

From Dante to Luther and Erasmus, 1300-1550.

112. EUROPEAN LITERATURE II

From Montaigne to Goethe, 1550-1780.

113. EUROPEAN LITERATURE III

From Diderot to Strindberg, 1780-1870.

114. EUROPEAN LITERATURE IV

From Baudelaire to Pasternak and St. John Perse, 1870 to present.

HISTORY

EDWIN A. BEILHARZ, PH.D., *Chairman*

REQUIREMENTS FOR BACHELOR OF ARTS

Students who wish to make History their major subject, besides completing the other required courses in lower division, must pass the courses in History 4A-4B and History 17A-17B with at least a grade of C.

The major program must include seven term courses in the upper division. History 101 is required. An average grade of C must be maintained in all courses of the major. At the end of the senior year each student must be prepared to pass a comprehensive final examination.

REQUIREMENTS FOR MASTER OF ARTS

COURSE PREREQUISITES

A Bachelor's degree with an undergraduate major in History is the ordinary prerequisite to study for the Master's degree. A minimum of ten courses is required. Of these, two may be in lower-division courses and eight in upper-division courses. Among the courses presented must be included two courses in The History of Western Civilization, two courses in the History of the United States, and a course introductory to Historical Method and Bibliography. A candidate for admission who presents other courses than these may be required to include some or all in the graduate program.

MODERN LANGUAGE EXAMINATIONS

Before advancement to candidacy, applicants for the Master's degree must pass a written examination to establish their reading ability in either French or German. These examinations are administered by the History Department on dates established in the University calendar. With the consent of the Department, and where the proposed field of study justifies it, another modern language may be substituted.

HISTORY COURSES (HS)

4A-
4B. HISTORY OF WESTERN CIVILIZATION. Two Terms.

A general survey of Western culture from its beginnings to the present, emphasizing those institutions which have shaped modern civilization.

17A-
17B. SURVEY OF UNITED STATES HISTORY. Two Terms.

A general course tracing the major political, social, economic, and expansionist trends in our history from colonial origins to recent times.

101. HISTORICAL METHOD AND HISTORIOGRAPHY.

Prescribed in the junior year for, and restricted to, students majoring in History. Two papers and a bibliography are prepared by each student. The use of the library is emphasized.

121. THE MIDDLE AGES

A study of the development of medieval society and institutions leading to the cultural flowering of the High Middle Ages, and to its decline.

131. THE RENAISSANCE AND REFORMATION

A critical study of the revival of the old and the birth of new learning. The Protestant Revolt and the Catholic Counter Reformation.

132. THE SEVENTEENTH AND EIGHTEENTH CENTURIES

The rise of absolute monarchs. The struggle for European preeminence and world empire. The Benevolent Despots.

133. THE FRENCH REVOLUTION

A study of the causes, the course, and the consequences of the French Revolution and the career of Napoleon.

135. RUSSIA

The changing patterns of Russian society, economy, and political organization from the rise of the Romanovs to the present.

144. EUROPEAN DIPLOMATIC HISTORY

A study of the relations of the major European powers since 1848, with emphasis on the economic, political, and social factors which influenced these relations.

145. THE NINETEENTH CENTURY

A study of the revolutionary movements in Europe stemming from the French and Industrial Revolutions. The rise of the middle classes and the struggle for liberal constitutional government. Underlying social unrest.

146. THE TWENTIETH CENTURY

The intensification of national and imperial rivalries in Europe, culminating in universal wars. Social upheavals and their effects. Attempts at world organization to enforce peace.

151. ENGLAND

The growth of the English state and constitution. The English Reformation. Constitutional struggles under the Tudor and the Stuart monarchs.

155. THE BRITISH COMMONWEALTH AND EMPIRE

A study of developments in England and in the British world system in modern times. The rise of the free dominions and the emergence of autonomous states within that system.

161A-
161B. LATIN AMERICA. Two Terms.

The old world and American background. European exploration and conquest. Colonial systems of the Hispanic American area. The revolutions in North and South America. Organization and development of the new American nations. Pan Americanism and inter-American relations.

165. ARGENTINA, BRAZIL, AND CHILE

A survey of the political, social, and economic development of these leading South American countries from aboriginal times to the present, with special emphasis on their recent histories.

166. MEXICO

A survey of Mexican history from the Maya and Aztecs to the present. Special emphasis on those factors in the more recent national period which have contributed to the development of the Mexican national character.

167. DIPLOMATIC HISTORY OF THE UNITED STATES

A survey of the international relations of the United States, with special emphasis on the period since 1890, and on the economic, political, social, and public opinion forces influencing the development of American policy.

172. THE JACKSONIAN ERA

A study of the social and political reforms, the expansion and economic change, the sectionalism and national politics of the period between 1812 and 1850.

173. CIVIL WAR AND RECONSTRUCTION

A survey of the major aspects of the Civil War and the problems involved in the years of reconstruction.

174A-
174B. THE UNITED STATES IN THE TWENTIETH CENTURY

Two Terms.

Transformations in American life, society, culture, and world position. Prerequisite: History 17B.

187. HISTORY OF THE WEST

The spread of the frontier and the emergence of special western problems, with emphasis on the period since the Civil War.

189. CALIFORNIA

The history of California, with major attention given to the period following its annexation to the United States.

191. THE FAR EAST

A general history of the East Asiatic nations, with emphasis on the modern period.

198. DIRECTED RESEARCH

A course of readings in source materials and pertinent secondary works dealing with special historical problems. Prerequisites: Upper-division course work in the area to be covered; a B average in History.

201A-
201B. HISTORIOGRAPHY AND HISTORICAL CRITICSM (3-3)

A study of selected historians and schools of historical interpretation.

220. SEMINAR IN MEDIEVAL HISTORY (3)

240. SEMINAR IN MODERN EUROPEAN HISTORY (3)

260. SEMINAR IN DIPLOMATIC HISTORY (3)

270. SEMINAR IN UNITED STATES HISTORY (3)

280. SEMINAR IN NORTH AMERICAN HISTORY (3)

283. SEMINAR IN HISPANIC AMERICAN HISTORY (3)

298. DIRECTED RESEARCH (3-9)

HONORS DIVISION

JEROME G. KERWIN, PH.D., *Director*

Students accepted into the Honors Division may undertake an Honors degree in any of the major programs offered by the College of Arts and Sciences. Each year the Division accepts from twenty-five to thirty entering freshmen as candidates for Honors. These students remain in candidate status through their sophomore year; then, provided they meet established norms of Honors performance, they are accepted as Honors students in full status.

The Honors Division accepts applicants for late entry into the sophomore year.

HONORS COURSES (HO)

1. TUTORIAL READING I

   Study of those classic texts which best introduce the student to the difficulty of intellectual inquiry. The purpose is to develop the ability to reason dialectically and to read a work well. Readings taken from the poetic, philosophic, and scientific works of the ancient, medieval, and modern periods.
   Freshman year, Fall term.

2. TUTORIAL READING II

Continuation of HO 1. Freshman year, Winter term.

3. TUTORIAL READING III

Continuation of HO 1 and 2. Freshman year, Spring term.

10. TUTORIAL READING IV

Study of those classic texts which best introduce the student to the order of nature and to the methods appropriate to its investigation. Readings taken from poetic, philosophic, and scientific works of the ancient, medieval, and modern periods. Sophomore year, Fall term.

11. TUTORIAL READING V

Continuation of HO 10. Sophomore year. Winter term.

12. TUTORIAL READING VI

Continuation of HO 10 and 11. Sophomore year, Spring term.

100. TUTORIAL READING VII

Tutorial is elective during the junior year and considers special questions in literature, philosophy, or theology. The staff determines the number and character of questions to be treated in a given year. Junior year, Fall term.

101. TUTORIAL READING VIII

Continuation of HO 100. Junior year, Winter term.

102. TUTORIAL READING IX

Continuation of HO 100 and 101. Junior year, Spring term.

150. TUTORIAL READING X

Study of those classic texts which best introduce the student to the moral and political order. Readings taken from poetic, philosophic, and scientific works of the ancient, medieval, and modern periods. Senior year, Fall term.

151. TUTORIAL READING XI

Continuation of HO 150. Senior year, Winter term.

152. TUTORIAL READING XII

Continuation of HO 150 and 151. Senior year, Spring term.

LANGUAGES

VICTOR B. VARI, PH.D., *Acting Chairman*

The degree of Bachelor of Arts may be taken in French or Spanish. In addition to French 12 or Spanish 12, candidates must complete seven upper-division courses in their language.

REQUIREMENTS FOR BACHELOR OF ARTS IN FRENCH

French majors should complete all lower-division requirements before the end of their sophomore year. An average of at least C must be maintained in both lower- and upper-division work. The major program includes seven terms of upper-division work and one year of college Latin or its high-school equivalent. Latin Literature in Translation (LA 109) or Greek Literature in Translation (GK 109) or European Literature in Translation (EL 111, 112, 113, 114) are recommended. General Linguistics (LN 75) is recommended to French majors in the pre-teaching program, preferably in the freshman or sophomore year.

REQUIREMENTS FOR BACHELOR OF ARTS IN SPANISH

Spanish majors should complete all lower-division requirements before the end of the sophomore year. An average of at least C must be maintained in both lower- and upper-division work. The major program includes seven courses of upper-division work and one year of college Latin or its high-school equivalent. Courses in Latin Literature in Translation (LA 109) or Greek Literature in Translation (GK 109) or European Literature in Translation (EL 111, 112, 113, 114) are recommended along with the History of the Americas (HS 161A-161B). General Linguistics (LN 75) is recommended to Spanish majors in the pre-teaching program, preferably in the freshman or sophomore year.

MINORS

A minor (four upper-division courses) is offered in German, Italian, and Latin.

LANGUAGE LABORATORY

During the first four courses in French, German, Italian, and Spanish, and during the first two terms of Russian, students are required to use language laboratory level-three machines approximately an hour a day to increase their skills in listening comprehension, pronunciation, and speaking. These listen-respond record exercises are supplementary to the required hours of classroom work.

FRENCH COURSES (FR)

1, 2. ELEMENTARY FRENCH

Drill in pronunciation, elements of grammar, and vocabulary Progressive exercises in reading, writing, and speaking. Language laboratory work required.

11, 12. INTERMEDIATE FRENCH

Review of grammar and syntax. Reading of original authors Exercises in translation, composition, and conversation. Language laboratory work required. Prerequisite: FR 2 or equiv.

100. PHONETICS, COMPOSITION AND CONVERSATION

111. THE MIDDLE AGES AND RENAISSANCE

121. THE SEVENTEENTH CENTURY I

Romanesque and Baroque, 1598-1650.

122. THE SEVENTEENTH CENTURY II

The Classical Period, 1650-1715.

123. THE SEVENTEENTH CENTURY

Corneille, Racine, Moliere.

131. THE EIGHTEENTH CENTURY

141. THE NINETEENTH CENTURY I

Romanticism.

142. THE NINETEENTH CENTURY II

Realism and Symbolism.

151. CONTEMPORARY FRENCH LITERATURE I

152. CONTEMPORARY FRENCH LITERATURE II

190. DIRECTED READING

199. SUPERVISED RESEARCH

GERMAN COURSES (GR)

1, 2. ELEMENTARY GERMAN

Drill in pronunciation, elements of grammar, and vocabulary. Progressive exercises in reading, writing, and speaking. Language laboratory work required.

11,
12. INTERMEDIATE GERMAN

Review of grammar and syntax. Reading of original authors. Exercises in translation, composition, and conversation. Language laboratory work required.

100. GERMAN COMPOSITION, CONVERSATION AND READING

101. SURVEY OF GERMAN LITERATURE I

The Middle Ages to Romanticism.

102. SURVEY OF GERMAN LITERATURE II

Romanticism to the present.

111. THE CLASSICAL PERIOD

121. NINETEENTH CENTURY GERMAN LITERATURE

131. TWENTIETH CENTURY GERMAN LITERATURE

190. DIRECTED READING

GREEK COURSES (GK)

1, 2. ELEMENTARY GREEK

Inflections and syntax. Composition.

13. BIBLICAL GREEK*

Selected readings from the New Testament.

20. ATTIC PROSE*

21. PLATO

22. HOMER

101,
102. SURVEY OF GREEK LITERATURE*

103. GREEK DRAMA*

105. GREEK ORATORY*

107. HOMER*

109. GREEK LITERATURE IN TRANSLATION

No language prerequisite. Not applicable to language requirement.

*Offered only on the Los Gatos campus.

ITALIAN COURSES (IT)

1, 2. ELEMENTARY ITALIAN

Drill in pronunciation, elements of grammar and vocabulary. Progressive exercises in reading, writing, and speaking. Language laboratory work required.

11, 12. INTERMEDIATE ITALIAN

Review of grammar and syntax. Reading of original authors. Exercises in translation, composition, and conversation. Language laboratory work required. Prerequisite: IT 2 or equivalent.

100. ITALIAN COMPOSITION, READING, AND CONVERSATION

101. SURVEY OF ITALIAN CULTURE AND CIVILIZATION I

From its origin to the "settecento."

102. SURVEY OF ITALIAN CULTURE AND CIVILIZATION II

111. MANZONI, I PROMESSI SPOSI

121, 122. DANTE, *LA DIVINA COMMEDIA* I, II

131. MODERN ITALIAN LITERATURE I

190. DIRECTED READING

LATIN COURSES (LT)

1, 2. ELEMENTARY LATIN

Inflections and syntax. Reading and composition.

3, 4. INTERMEDIATE LATIN

Reading of Cicero's speeches and Vergil's *Aeneid*. Composition.

5. ECCLESIASTICAL LATIN*

Selections from Church documents.

7, 8. LATIN PROSE COMPOSITION*

17, 18. LATIN CONVERSATION*

19. DIRECTED READING*

*Offered only on the Los Gatos campus.

100. CAESAR, CIVIL WAR

101. CICERO, PHILOSOPHICAL DIALOGUES

102. LIVY, BOOKS XXI AND XXII

104. HORACE *ODES* AND *EPODES*

105. VERGIL, SELECTIONS FROM THE *AENEID*

109. LATIN LITERATURE IN TRANSLATION

No language prerequisite. Not applicable to language requirement.

110. CICERO'S ORATIONS

113, 114. SURVEY OF LATIN LITERATURE I, II

115, 116. ADVANCED PROSE COMPOSITION I, II*

117, 118. ADVANCED LATIN CONVERSATION I, II*

190. DIRECTED READING

LINGUISTICS COURSE (LN)

75. GENERAL LINGUISTICS

A study of nature of language in the present and past. The relation of language to culture. Methods of teaching language. No language prerequisite. Not applicable to the language requirement.

RUSSIAN COURSES (RS)

1, 2. ELEMENTARY RUSSIAN

Drill in pronunciation, elements of grammar, and vocabulary. Progressive exercises in reading, writing, and speaking. Language laboratory work required.

SPANISH COURSES (SP)

1, 2. ELEMENTARY SPANISH

Drill in pronunciation, elements of grammar, and vocabulary. Progressive exercises in reading, writing, and speaking. Language laboratory work required.

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*Offered only on the Los Gatos campus.

11,

12. INTERMEDIATE SPANISH

Review of grammar and syntax. Reading of original authors. Exercises in translation, composition, and conversation. Language laboratory work required. Prerequisite: SP 2 or equivalent.

100. SPANISH COMPOSITION, CONVERSATION, AND READING

101. SURVEY OF SPANISH LITERATURE I

From the origins to the "Siglo de Oro."

102. SURVEY OF SPANISH LITERATURE II

From the decadence to the Twentieth Century.

103. SURVEY OF LATIN-AMERICAN LITERATURE I

104. SURVEY OF LATIN-AMERICAN LITERATURE II

111. CERVANTES AND THE GOLDEN AGE OF SPANISH LITERATURE

113. MODERN SPANISH LITERATURE

121. CONTEMPORARY LATIN-AMERICAN LITERATURE

190. DIRECTED READING

199. SUPERVISED RESEARCH

MATHEMATICS

Irving Sussman, Ph.D., *Chairman*

The Department of Mathematics offers work leading to a major or a minor in mathematics and, in addition, offers required and elective courses for students majoring in other fields. For experienced teachers of high-school mathematics the Department offers a special graduate program for the terminal degree Master of Science in Teaching Mathematics (M.S.T.M.).

UNDERGRADUATE PROGRAM

Requirements for Bachelor of Science

The student majoring in Mathematics is required to take Mathematics 11, 12, 13, 21, 52, and 53 followed by seven courses normally chosen from Mathematics 101, 102, 103, 111, 112, 113, 122, and 133, unless the student enters with advanced placement. Courses numbered 101 and beyond have a prerequisite of Mathematics 11, 12, 13. A major must obtain a grade of C or better in each of the 13 required Mathematics courses.

In addition to the Mathematics courses above, the major in Mathematics must complete Physics 4A, 4B, and 4C, and a minimum of three term courses in at least one, and preferably two, foreign languages chosen from the following: French, German, Russian. The student must also fulfill the general requirements of the College of Arts and Sciences. Consultation with the Department Chairman before the junior year is necessary for admission to the major program. In general, a student will be permitted to undertake upper-division work only if his grades in the lower-division prerequisites clearly indicate an aptitude and the ability to undertake the more advanced work successfully.

Departmental Scholars Program

The Department of Mathematics has a program for the discovery, encouragement, and development of mathematical talent among undergraduates, based on special sections of multisectioned courses, seminars, individual conferences, solution of challenging problems, competitive examinations, independent study, undergraduate research, and special theses. This program is strongly recommended to all students who plan graduate work in Mathematics. Admission to the program as Scholars at Entrance is open to exceptional entering freshmen. In addition, students of superior ability who show unusual interest may be admitted during their freshman, sophomore, or junior year. Sections of Mathematics 11, 12, 13, 21, 99, and 199 are conducted as part of the program.

Participants who maintain at least a 3.5 grade-point average in Mathematics and a 3.0 over-all and who do excellent work will be recommended for graduation as Scholars in Mathematics by the Mathematics Committee on Departmental Scholars. Interested students may apply to Professor A. P. Hillman, Director of the Program.

GRADUATE PROGRAM

Requirements for Master of Science in Teaching Mathematics

Prerequisites

The required baccalaureate degree need not be in Mathematics. The candidate must have two years' experience as a full-time teacher of Mathematics in a departmentalized high school or junior college. The following undergraduate Mathematics is also a prerequisite for this program: 9 quarter-units of analytic geometry and calculus, 4 quarter-units of college algebra, and one year of college physics.

Residence Requirement

By a special arrangement unique to this degree, a candidate may receive residence credit for the successful completion of approved study done in National Science Foundation In-Service and Summer Institutes held on this and affiliated campuses and supported by grants awarded to the University of Santa Clara. However, in each case a minimum of two summer sessions or one term must be completed in actual residence on the main campus of the University of Santa Clara.

Course Requirements

The degree of Master of Science in Teaching Mathematics requires satisfactory completion of 45 appropriate quarter-units (30 semester units) of upper-division or graduate work in mathematics, of which 6 may be earned by some combination of thesis and directed study. Not less than 3, nor more than 18, quarter-units must be taken in each of the following four areas: Algebra (MA 111, 112, 133, 179), Geometry (MA 101, 113, 178), Analysis (MA 102, 103, 154, 155), Applied Mathematics (MA 122, 123, 130, 133, 144, 166).

Thesis

The thesis need not be based on original research in Mathematics but may be expository in character. However, in every case the thesis must represent a valuable contribution to Mathematics education in the high schools.

Comprehensive Examinations

Oral or written comprehensive examinations may be imposed at the discretion of the Committee for the M.S.T.M. degree, whether the thesis option is taken or not.

Committee for the Master of Science in Teaching Mathematics Degree

Ex-officio members of this committee are Alexis I. Mei, S.J., Ph.D., Academic Vice-President of the University of Santa Clara; Professor Irving Sussman, Ph.D., Coordinating Director N.S.F. Programs and Chairman of the Department; Professor A. P. Hillman, Ph.D., Associate Professor of Mathematics. Three additional members will be appointed from the staff of the N.S.F. Institutes faculty, which currently consists of the following professors: Professor G. Polya, Ph.D., Stanford University; Professor M. Kramer, Ph.D., San Jose State College; Sister M. Rose, Ph.D., College of the Holy Names; Sister R. Julie, Ph.D., College of Notre Dame; Professor J. Ancheschi, Ph.D., College of the Holy Names; and Professor E. Whitmore, Ph.D., San Francisco State College.

MATHEMATICS COURSES (MA)

1. ALGEBRA AND TRIGONOMETRY

   A course in algebra and trigonometry, primarily for students in engineering and the sciences. Fall, Winter, and Spring terms.

2. BASIC CONCEPTS OF MODERN MATHEMATICS

   Designed for prospective teachers. Topics include the algebra of sets, number systems, and inequalities. Winter term.

3. FINITE MATHEMATICS

   Designed for students in the biological and social sciences. Topics include the algebra of sets, partitions and enumeration, probability, linear programming, and applications. Fall, Winter, and Spring terms.

11. ANALYTIC GEOMETRY AND CALCULUS I

    Elementary analytic geometry, differentiation, applications of differentiation, and integration. Prerequisite: Mathematics 1 or a satisfactory score on the University placement examination. Fall and Winter terms.

12. ANALYTIC GEOMETRY AND CALCULUS II

Applications of integration, transcendental functions, methods of integration, determinants and linear equations, plane analytic geometry, hyperbolic functions. Prerequisite: Mathematics 11. Winter and Spring terms.

13. ANALYTIC GEOMETRY AND CALCULUS III

Polar coordinates, vectors, parametric equations, solid analytic geometry, partial differentiation, multiple integration. Prerequisite: Mathematics 12. Fall and Spring terms.

21. CALCULUS AND DIFFERENTIAL EQUATIONS

Infinite series. Solutions of ordinary differential equations, existence theorems, series solutions. Prerequisite: Mathematics 13. Fall and Winter terms.

52. INTRODUCTION TO MODERN ALGEBRA

Groups, fields, integral domains, applications to number theory. Polynomials and polynomial equations. Winter term.

53. LINEAR ALGEBRA

Vector spaces, linear transformations, algebra of matrices, quadratic forms, characteristic equations. Spring term.

92. HISTORY AND METHODOLOGY OF SCIENCE I: MATHEMATICS

An introduction to mathematical techniques along with a survey of important problems in mathematics with their historical background. This course is available only to students in the Honors Division. Winter term.

93. HISTORY AND METHODOLOGY OF SCIENCE II: MATHEMATICS

A continuation of Mathematics 92. Spring term.

99. LOWER-DIVISION SEMINARS

Basic techniques of problem solving in algebra, geometry, and analysis. Fall, Winter, and Spring terms.

101. A SURVEY OF GEOMETRY

Topics from projective geometry, advanced Euclidean geometry and non-Euclidean geometries. Fall term.

102. ADVANCED CALCULUS

Vector calculus, functions of several variables, elliptic integrals,

line integrals, uniform convergence, introduction to Fourier series. Winter term.

103. THEORY OF FUNCTIONS OF A COMPLEX VARIABLE

Analytic functions, Cauchy integral theorems, power series, conformal mapping, Riemann surfaces. Spring term.

107. ELEMENTARY MATHEMATICS FROM THE ADVANCED STANDPOINT I

Designed for secondary school teachers. Topics in elementary mathematics treated in a manner emphasizing the underlying structure and fundamental concepts.
Fall, Winter, and Spring terms.

108. ELEMENTARY MATHEMATICS FROM THE ADVANCED STANDPOINT II

A continuation of Mathematics 107. This course may be taken without Mathematics 107 as a prerequisite upon the consent of the instructor. Fall, Winter, and Spring terms.

111. ABSTRACT ALGEBRA I

Boolean algebra, transfinite arithmetic, advanced topics in the theory of numbers. Prerequisites: Mathematics 52 and 53. Fall term.

112. ABSTRACT ALGEBRA II

Rings and ideals, algebraic extensions of fields, Galois Theory. Prerequisites: Mathematics 52 and 53. Winter term.

113. TOPOLOGY

Theory of sets, metric spaces, topological spaces, and transformations. Spring term.

122. PROBABILITY AND STATISTICS I

Axioms and basic laws; independence; distributions; random variables; expectation. Winter term of Alternate Years.

123. PROBABILITY AND STATISTICS II

Statistical inference; point estimation; statistical hypotheses; analysis of variance. Spring term of Alternate Years.

130
A-B. INTRODUCTION TO MATHEMATICAL PHYSICS

These courses are offered by the Department of Physics and may be taken as mathematics courses. See Physics 130A and 130B.

133. SYMBOLIC LOGIC

Introduction to formal logic, propositional calculus, consistency, completeness, decidability. Set theory and Boolean algebra. Spring term of Alternate Years.

190. INDEPENDENT STUDY

Reading and investigation for superior students under the direction of a staff member. Fall, Winter, and Spring terms.

199. UPPER-DIVISION SEMINARS

Advanced topics in algebra, geometry, or analysis. Fall, Winter, and Spring terms.

The following courses may be given less frequently.

144. ADVANCED ENGINEERING MATHEMATICS

Special topics in higher mathematics useful to engineers and physicists, such as hyperbolic functions, elliptic integrals, Fourier series, partial differential equations. Applications.

154. INTERMEDIATE ANALYSIS

A rigorous investigation of the real number system. Concepts of limit; continuity, differentiability of functions of one real variable; theorems of differential and integral calculus.

155. DIFFERENTIAL EQUATIONS

Existence and nature of solutions; oscillation theory, orthogonal functions.

166. NUMERICAL ANALYSIS

Interpolation formulas. Numerical differentiation and integration. Numerical solution of algebraic, transcendental, and differential equations.

170. DEVELOPMENT OF MATHEMATICS

A selection of mathematical concepts given with their historical context.

172. PROBLEM SOLVING

Use of induction, analogy, and other techniques in solving mathematical problems.

178. CONVEX SETS

Convex regions in Euclidean spaces. Helly's Theorem and applications, the isoperimetric problem, curves of constant width.

179. MATRIX THEORY

Linear transformations, matrices and determinants, quadratic forms, Cayley-Hamilton Theorem.

MUSIC

CARROLL G. LAUBACHER, S.J., M.MUS., *Chairman*

The University offers no major in music. However, music courses are offered as electives for credit in any of the University programs.

Extracurricular activities in Music, such as the Men's Glee Club and the Women's Chorus, are directed by members of the Department.

MUSIC COURSES (MU)

10. MUSIC OF THE WESTERN WORLD

Techniques of listening to masterpieces of various forms, styles, and mediums by composers from the Baroque through the Romantic periods.

21. INTRODUCTION TO THE THEORY OF MUSIC

Basic terminologies and problems of notation, material for developing the fundamental skills of performance, study of scales and intervals, practice in writing melodies. Consent of instructor required. Fall term.

30. SACRED CHORAL MUSIC

History, analysis, and performance of selected works: Gregorian Chant, Polyphony, Classic, Romantic and Modern works. Sacred music sung in the Mission Church. Admission by audition only.

112. TRADITIONAL PRINCIPLES AND PRACTICES I

From Gregorian Chant to the Age of Bach and Handel (1000-1700). History and analysis of outstanding works, with exercises emulating forms and styles. Prerequisite: Music 21. Winter term.

113. TRADITIONAL PRINCIPLES AND PRACTICES II

From Bach and Handel through the Viennese Classical Period (1700-1800). History and analysis of outstanding works, with exercises emulating instrumental and vocal forms and styles, such as the invention, the suite, the smaller sonata movements, the chorale, and the oratorio. Prerequisite: Music 112. Spring term.

121. TRADITIONAL PRINCIPLES AND PRACTICES III

From the Romantic Period through Impressionism (1800-1900). History and analysis of outstanding works, with exercises emulating pieces by Schumann, Chopin, Brahms, Schubert, Verdi, and Wagner. Prerequisite: Music 113. Fall term.

122. TWENTIETH CENTURY PRINCIPLES AND PRACTICES

History and analysis of outstanding works, with exercises emulating the forms and styles of works of Bartok, Hindemith, Schoenberg, and Stravinsky. Prerequisite: Music 121.

141. SEMINAR: MUSIC IN THE NINETEENTH CENTURY

Forms and styles of great composers of the Nineteenth Century and the influence of their ideas on Western culture and political history.

PHILOSOPHY

AUSTIN FAGOTHEY, S.J., PH.D., *Chairman*

Students majoring in Philosophy, besides completing the other required courses, must pass the lower-division courses of Philosophy 1 and 2 with at least a grade of C. It is recommended that they also take Philosophy 3. In upper division they must take eight courses in Philosophy, three of them prescribed (101, 102, and 103) and the remaining five to be chosen from among the elective courses listed below. An average grade of C must be maintained in the major subject. A senior thesis must be presented to and approved by the Department.

Three of the elective courses are offered each term. Philosophy 110, 120, and 130 are offered each year, the remaining courses every other year. All these courses may be taken in the junior or the senior year, preferably the latter. However, a student who wishes to be certain of getting a definite special course that is not repeated each year should take it at the earliest opportunity.

Students in Arts not majoring in Philosophy are required to take Philosophy 1, 2, 101, 102, 103, and one course chosen by the student from among the elective courses listed below – six courses in all.

Students majoring in the Natural Sciences and in Business Administration are required to take Philosophy 1, 2, 101, 102, and 103.

Students in Engineering are required to take Philosophy 4, 101, and 102.

Students in Nursing are required to take Philosophy 5.

PHILOSOPHY COURSES (PL)

Required Courses

1. HISTORY OF ANCIENT AND MEDIEVAL PHILOSOPHY

A comprehensive survey of the history of philosophy from its beginning with the Greeks to the end of the medieval period.

2. HISTORY OF MODERN AND RECENT PHILOSOPHY

A continuation of Philosophy 1 and extending from the Renaissance to the present day. Prerequisite: PL 1.

3. LOGIC

Introduction to traditional or Aristotelian logic. Science of correct thinking, deductive and inductive inference. Exercises in logical thinking.

4. INTRODUCTION TO PHILOSOPHY

Survey of the main problems of philosophy. Open only to Engineering students.

5. ETHICS AND MEDICAL ETHICS

General principles of morality and their practical application to the chief spheres of human conduct. Medical aspects of morality. Open only to student nurses.

101. PHILOSOPHY OF MAN

Philosophical psychology as distinct from empirical psychology. Man in his unity; his sensitive, intellectual, and volitional life. Prerequisites: PL 1 and 2, or 4.

102. METAPHYSICS

Ontology and natural theology. Being and becoming, essence and existence, substance and accident, cause and effect. Philosophical theories on God and the universe evaluated. Prerequisite: PL 101.

103. ETHICS

The general principles of morality. Human conduct, moral standards, the moral law, obligation and responsibility, virtue and vice, rights and duties. Prerequisite: PL 102.

Elective Courses

110. THEORY OF KNOWLEDGE

A critique of knowledge: idealistic and realistic attitudes. The metaphysics of knowledge: formal truth and certitude.

111. PLATO AND ARISTOTLE

Reading, interpretation, and discussion of some of the major works of these two authors. Critical evaluation. Their influence on Western thought.

112. PHILOSOPHY OF HISTORY

A study of the attempts philosophers have made to discover the nature of history and its recurrent patterns, if any. Critical evaluation of these theories.

113. AMERICAN PHILOSOPHY

Reading, interpretation, and discussion of selected major works of major American thinkers. Critical evaluation. Their influence on American culture.

114. AESTHETICS

An historical introduction to the problems of aesthetics and the study of human creativity. A consideration of the beautiful, the relationship of art and prudence, the nature of poetic intuition.

115. PHILOSOPHY AND ART

Problems arising in the interrelationships of aesthetics and philosophy, such as the nature of the person as source of the creative act, and the ultimate meaning of creativity itself.

120. CONTEMPORARY PROBLEMS

Analysis of one or several problems arising from outstanding contemporary writings, selected at the discretion of the instructor. Readings and discussions.

121. SEVENTEENTH CENTURY PHILOSOPHY

The rationalism of Descartes, Spinoza, and Leibniz, as contrasted with the empiricism of Locke, Berkeley, and Hume. A more intensive study of some of these philosophers' writings.

122. EXISTENTIALISM

The existentialist movement in Continental European thought. Kierkegaard, Heidegger, Jaspers, Sartre, Marcel, and their impact on present-day culture.

123. THOMISTIC SYNTHESIS

An attempt, working from the Thomistic text, to disengage the fundamental unifying principles which give Thomistic philosophy its lasting value.

124. SYMBOLIC LOGIC

The methods and principles of symbolic logic, as developed from postulational beginnings. Elementary set theory. Development of the propositional calculus.

130. SOCIAL ETHICS

The application of general moral principles to definite phases of human living. The ethics of society: domestic, industrial, political, and international.

131. GERMAN TRANSCENDENTALISM

Reading, analysis, discussion, and criticism of some of the major writings of philosophers of this group, especially works of Kant and Hegel.

132. PHILOSOPHY OF SCIENCE

Points of contact between philosophy and science. Scientific methodology: its aim, procedure, and validity.

133. PHILOSOPHY OF COMMUNISM

Critical analysis of the philosophical tenets of Marxism and subsequent Communist theory. Dialectical materialism: its signification, interpretation, and implementation.

134. PHILOSOPHY OF NATURE

The main problems of cosmology. The structure of the physical universe and its philosophical interpretation.

PHYSICS

JOHN B. DRAHMANN, PH.D., *Chairman*

REQUIREMENTS FOR BACHELOR OF SCIENCE

A minimum of seven courses beyond Physics 4A, 4B, 4C, and 4D is required for the Bachelor of Science degree in Physics. Normally the required courses will include Physics 20, 101A, 101B, 105, 110A, 120A, and 110B or 120B. Mathematics 102 and Chemistry 1A, 1B are required of all students majoring in Physics. Regardless of his background in languages, each student majoring in Physics must take at least two courses in French, German, or Russian. In addition, he must give evidence of a reading knowledge of one of these languages in an examination consisting of the translation of selected articles from physics journals.

DEPARTMENTAL SCHOLARS PROGRAM

Students of superior initiative and ability may apply for the Departmental Scholars Program. This is a four-year plan of study which will have particular appeal to those students who have the ability and motivation to continue their studies at the graduate level. The purpose of the program is to provide outstanding students with unique opportunities to develop their abilities to the maximum. Freshmen entering with a high-school grade-point average of 3.5 or better, and a Scholastic Aptitude Test score of 1350, or better, may apply for an interview with the Chairman of the Department for admission to the Program at the time of entrance.

Students who were not designated Scholars at Entrance may apply for admission to the Departmental Scholars Program at any time during their sophomore and junior years. To be eligible, they must have maintained a B average in all courses taken during the two terms immediately prior to application for admission. They must also have earned a minimum grade of B in all science and mathematics courses required for the major.

In addition to accepting added responsibility for their own education, Scholars in the Department of Physics will enjoy certain privileges. These will include:

1. Eligibility to elect Scholars courses in the Department. These will include Physics 130A, 130B (Methods of Mathematical Physics) and Physics 180 (Quantum Mechanics).

2. Eligibility to take Scholars courses in other departments.

3. Eligibility to elect Physics 199 (Independent Study in Physics).

4. Eligibility to elect Physics 190 (Undergraduate Physics Research). Work, under the close supervision of one of the professors, will be on either the experimental or the theoretical aspects of the research in progress in the Department. Therefore, he will gain valuable experience in the methods and techniques used in modern physical research. He must present his results and conclusion in a Scholars paper to the Physics Department Colloquium.

Should a student find that he cannot maintain the standard of work required of those in the Departmental Scholars Program, he may, with the recommendation of the Department Chairman, withdraw from the Program. He must then complete the requirements for the degree in the usual manner.

PHYSICS COURSES (PH)

2A. GENERAL PHYSICS

Mechanics, heat, and sound. Elective for nonscience majors. Required course for premedical students. Prerequisite: MA 1 or equivalent. Fall term.

2B. GENERAL PHYSICS

Electricity and magnetism. Light and modern physics. Prerequisite: PH 2A. Winter term.

4A. PHYSICS FOR SCIENTISTS AND ENGINEERS

Vectors. One- and two-dimensional motion. Particle dynamics. Work and energy. Conservation of energy and linear momentum. Rotational motion. Statics. Oscillatory motion. Gravitation. Fluid statics. Prerequisites: MA 11, 12 (MA 12 may be taken concurrently). Spring term.

4B. PHYSICS FOR SCIENTISTS AND ENGINEERS

Waves in elastic media. Heat. First and Second Laws of thermodynamics. Charge and matter. Electric field. Potential. Electromagnetic force. Current. Magnetic field. Prerequisites: PH 4A, MA 13 (may be taken concurrently). Fall term.

4C. PHYSICS FOR SCIENTISTS AND ENGINEERS

Ampere's Law. Faraday's Law. Induction. Magnetic properties of matter. Electromagnetic oscillations and waves. Reflection and refraction. Interference, diffraction, and polarization of light. Prerequisites: PH 4B, MA 21 (may be taken concurrently). Winter term.

4D. PHYSICS FOR SCIENTISTS AND ENGINEERS

Elementary modern physics. Special relativity. Quantum effects. Hydrogen atom. Many-electron atoms. X-rays. Nuclear structure. Nuclear reactions. Molecular and solid-state physics. Prerequisite: PH 4C. Spring term.

20. THERMODYNAMICS

Thermodynamic systems. Work. The First Law of thermodynamics and its consequences. Second Law. Entropy. Kinetic theory of gases. Introduction to statistical mechanics. Prerequisites: PH 4B, MA 21. Spring term.

101A. ELECTROMAGNETIC THEORY I

Electrostatic fields. Laplace's and Poisson's equations. Dielectrics. Magnetic fields of steady currents. Induced electromotive forces. Magnetic energy. Magnetic materials. Prerequisite: PH 4C. Winter term.

101B. ELECTROMAGNETIC THEORY II

Maxwell's equations. Plane waves in free space and in matter. Reflection and refraction. Interference and diffraction. Polarization. Guided waves. Radiation of electromagnetic waves. Prerequisite: PH 101A. Fall term.

105. ELECTRIC AND ELECTRONIC CIRCUITS

Linear electric circuit analysis. Electron tubes and transistors. Linear and piecewise analysis of selected electronic circuits. Emphasis on practical circuits used in physical research. Prerequisite: PH 4C. Fall term. NCX.

110A. CLASSICAL MECHANICS I

Statics of particles, rigid bodies, and continuous media. Newtonian dynamics of particles and rigid bodies. Prerequisites: PH 4A, MA 21. Fall term.

110B. CLASSICAL MECHANICS II

Lagrangian and Hamiltonian formulation of Newtonian dynamics of particles. Selected topics from relativistic dynamics, theory of small oscillations, and dynamics of continuous media. Prerequisite: PH 110A. Winter term.

116. PHYSICS OF SOLIDS

Crystal structure. Specific heats. Classical and free electron theory of metals. Band theory of solids. Magnetism. Superconductivity. Prerequisite: PH 120A or equivalent. Spring term.

120A. ATOMIC AND NUCLEAR PHYSICS I

Review of special relativity. Bohr atom. Particles and waves. Schroedinger's theory of quantum mechanics and applications. Perturbation theory. One-electron atoms. Prerequisite: PH 4D. Fall term.

120B. ATOMIC AND NUCLEAR PHYSICS II

Magnetic moments. Spin. Identical particles. Many-electron atoms. X-rays. Collision theory. Nuclear models. Alpha, beta, and gamma decay. Nuclear reactions. Nuclear forces. Prerequisite: PH 120A. Winter term.

130A. METHODS OF MATHEMATICAL PHYSICS I

Type of fields. Equations governing fields. Fields and the variational principle. Functions of a complex variable. Prerequisites: MA 102 and admission to the Departmental Scholars Program. Fall term. NCX.

130B. METHODS OF MATHEMATICAL PHYSICS II

Ordinary differential equations. Boundary conditions and eigenfunctions. Matrices and vector spaces. Prerequisites: PH 130A and admission to the Departmental Scholars Program. Winter term. NCX.

180. QUANTUM MECHANICS

Foundations of wave mechanics. Linear operators and eigenfunctions. Elementary theory of elastic scattering. Matrix mechanics and theory of angular momentum. Perturbation theory and theory of radiative transitions. Prerequisites: MA 102 and admission to the Departmental Scholars Program.
Spring term. NCX.

190. UNDERGRADUATE PHYSICS RESEARCH

Departmental work under close professional direction on research in progress, culminating in preparation of Scholar's paper. Prerequisites: Admission to the Departmental Scholars Program and permission of the Chairman of the Department. Fall, Winter, or Spring term.

199. INDEPENDENT STUDY IN PHYSICS

Detailed investigation of some area or topic in physics which is not covered in the regular courses, supervised by a faculty member. Prerequisites: Admission to the Departmental Scholars Program and permission of the Chairman of the Department. Fall, Winter, or Spring term.

POLITICAL SCIENCE

BERNARD L. KRONICK, PH.D., *Chairman*

Students who wish to major in Political Science, besides fulfilling the lower-division requirements of the College of Arts and Sciences and of the Social Science Division, must earn at least a C in Political Science 1 and 2.

The major program is to include seven upper-division courses in Political Science. Political Science 118A, 118B, and 157A must be part of this program. An average of C must be maintained in the courses in the major, and at the end of the senior year each student must pass a comprehensive examination.

Only students in the Departmental Scholars Program and in the Honors Division are eligible for the seminar courses (Political Science 191 to 196), which place special emphasis on independent study.

POLITICAL SCIENCE COURSES (PO)

1. INTRODUCTION TO AMERICAN GOVERNMENT

   The underlying principles of the American federal state. Basic ideas of American politics. The structure and powers of the American national government. Principles of the California constitution and government.

2. INTRODUCTION TO COMPARATIVE POLITICS

   Government and politics in Great Britain, France, Germany, and Russia. Emphasis upon the development of analytical abilities and critical skills in the evaluation of political behavior, processes, and institutions.

118A. POLITICAL PHILOSOPHY: THE CLASSICAL PERIOD

The metaphysical and ethical bases of the major political doctrines from Plato and Aristotle through St. Thomas Aquinas. Their relation to political development and to modern issues.

118B. POLITICAL PHILOSOPHY: THE MODERN PERIOD

From Marsiglio of Padua and Machiavelli through Hobbes, Locke, and Rousseau. Their relation to political development and to modern issues.

118C. POLITICAL PHILOSOPHY: THE CONTEMPORARY PERIOD

From the Utilitarians and Marx to the present. The relation of these doctrines to current political problems.

125A. INTERNATIONAL RELATIONS

Origins, forms, and forces of the state system. Conduct and practice of diplomacy. Structure and scope of international law. Development and uses of international organization in modern world politics.

125B. INTERNATIONAL RELATIONS

Contemporary problems of the modern state system. Power politics and the balance of power. Comparative foreign policies. Case studies in diplomacy. Applications of game theory.

128. AMERICAN FOREIGN POLICY

The conduct and control of American foreign policy as illustrated by the main trends and crises of the last twenty years.

132. THE REVOLUTION IN WORLD POLITICS

The pragmatic revolt in politics. Totalitarianism vs. constitutionalism. Colonialism and nationalism. Political anti-Semitism and Zionism. The Catholic Church in modern politics. The American impact upon world culture.

140A-
140B. COMPARATIVE POLITICAL BEHAVIOR

The interaction of the political system with the civic culture in Great Britain, France, Germany, Italy, Mexico and other selected modern states. Implications of semantics, personality study, and physical and cultural anthropology for politics.

141A-
141B. SOVIET POLITICS AND WORLD COMMUNISM

Origin and development of the Soviet party-state and its processes of government and politics. Foreign policy and the international Communist movement as a field of Soviet political activity.

142. THE EMERGING NATIONS

Change and continuity in the political behavior and institutions of the developing societies. Problems of political modernization and economic development in the countries of Latin America, South and Southeast Asia, the Near East, and Africa.

150A. THE AMERICAN POLITY

Advanced survey of American government. Studies in depth of the Presidency and Congress. Relations among the national,

state, and local levels of government. Select problems, programs, and policies.

151A-
151B-
151C. POWER AND LEADERSHIP IN AMERICAN DEMOCRACY

Concepts of political influence, power, authority, and responsibility applied to leadership roles in the public and business sectors of American life.

152. U. S. POLITICAL PARTIES

Origin, organization, and activities of U.S. political parties. Work of politicians, bosses, and machines. Government regulations and possible subsidy of parties. Election law and administration.

157A. AMERICAN CONSTITUTIONAL DEVELOPMENT

Historical treatment of the interpretation of the Constitution by the Supreme Court. Federalism, protection of property, relation of taxation to political issues, separation and delegation of powers.

157B. CIVIL LIBERTIES AND CIVIL RIGHTS

The legal and moral aspects of civil liberties issues and the economic, political, religious, and psychological bases of civil liberty conflicts in the United States.

162. U.S. MUNICIPAL GOVT. AND ADMINISTRATION

The development of the modern city. Relations of city government to other governmental units. Municipal politics. Types of municipal government. Current municipal problems. City and regional planning. Finance. Law enforcement.

172. U.S. STATE GOVERNMENT AND ADMINISTRATION

The development of state constitutions. Federal-state relations. Politics and elections. The legislative process. The courts. County government. The organization and current major problems of the state administrative system.

181. PUBLIC ADMINISTRATION IN THE U.S.

Basic divisions of the field of public administration: organizational theory, executive leadership, personnel administration, finance, administrative law, administrative responsibility. Examples from various levels of American government.

191. SEMINAR 1. PUBLIC AFFAIRS

Analysis of crucial issues of the day in national and international affairs. Extensive use of public documents and representative periodicals and newspapers, both domestic and foreign, and of significant major works on contemporary social politics.

194. SEMINAR 4. THE STRUCTURE OF POLITICAL THOUGHT

Topics in classical political philosophy.

195. SEMINAR 5. THE POLITICAL PHILOSOPHY OF ST. THOMAS MORE

Exegetical examination of the works of St. Thomas More. Concentration on *The History of King Richard III* and *The Utopia.*

196. SEMINAR 6. METHODOLOGY AND SENIOR THESIS

Theory, scope, methods, and literature of political science. Development of political science, its relation to other social sciences, varying approaches to the problems of this field, and techniques of research.

PSYCHOLOGY

RICHARD J. STANEK, PH.D., *Chairman*

Students majoring in Psychology, in addition to fulfilling the general requirements for a Bachelor of Arts degree, must successfully complete the following courses: Mathematics 2, Social Science 50, Sociology 1 or 2, Biology 2A and 2B, Psychology 1, 2, 100, 101, 120, 130, and three additional upper-division courses in Psychology. All courses in Psychology must be completed with an average grade of C or better. All students majoring in Psychology must obtain an adequate score in the Advanced Test in Psychology in the Graduate Record Examination in the spring term of their senior year.

Students who wish a minor in Psychology must complete Psychology 1, 2, 100, 101, 120, and an additional upper-division course in Psychology with an average grade of C or better.

Only students in the Departmental Scholars Program and students in the Honors Division are eligible to take the special seminars (Psychology 180 and 182) and independent research (Psychology 190).

PSYCHOLOGY COURSES (PS)

1. GENERAL PSYCHOLOGY

The scientific study of human and animal behavior in terms of perception, motivation, and adaptive efforts. Emphasis placed on an analytic understanding of the elements of behavior and experience. Winter term.

2. GENERAL PSYCHOLOGY

Neurological and physiological mechanisms underlying perception, motivation, and adaptive behavior. Man's abilities, personality development, and sociopsychological influences.
Spring term.

100. STATISTICAL AND EXPERIMENTAL DESIGN I

Statistical theory, methods and principles underlying psychological experimentation and measurement. Frequency distributions, indices of location and variation, etc. Lectures and laboratory. Fall term.

101. STATISTICAL AND EXPERIMENTAL DESIGN II

Basic elements of experimental procedures. Application of statistical principles to various experimental designs, analysis of variance, factorial designs, etc. Lectures and laboratory.
Winter term.

105. PERSONALITY AND ADJUSTMENT

An introduction to the psychology of personal and social adjustment. Personality patterns of the individual in various contexts, such as the family, the school, marriage, the adolescent years, social relations.

107. DEVELOPMENTAL PSYCHOLOGY

Developmental patterns in motor, linguistic, social, and emotional behavior. Individual differences in development and performance in terms of physical and psychological factors. Determinants of personality growth.

110. PSYCHOLOGY OF INDUSTRY

The application of psychological principles to industrial settings with particular emphasis on sociopsychological aspects of labor-management relations. The motivational factors in job satisfaction and performance.

115. INTRODUCTION TO ABNORMAL PSYCHOLOGY

A comprehensive treatment of the major forms of mental disorder with regard to their etiology, nature, development, and control. Current theories of mental disease. The psychology of abnormal thinking.

119. PSYCHOLOGY OF EDUCATION

Physical, mental, and moral changes occurring during the adolescent period. Development of attitudes, interests, and problems of the teenage period. Psychological principles of learning. NCX

120. EXPERIMENTAL PSYCHOLOGY I. PERCEPTION

A survey of the experimental literature on the major perceptual processes, such as vision, audition, etc. Problems of measurement and scaling. Demonstration of various perceptual phenomena. Lectures and laboratory.

130. EXPERIMENTAL PSYCHOLOGY II. LEARNING

A survey of the experimental literature on the basic forms of the learning process. Demonstrations in creative problem solving. The nature of concept formation. Lecture and laboratory.

140. EXPERIMENTAL PSYCHOLOGY III. MOTIVATION

A descriptive, developmental, and theoretical study of the various motivational processes. The influence of motives on the initiation, regulation, and direction of behavior. Theories of motivation. Lectures and laboratory.

145. ASSESSMENT OF HUMAN ABILITIES

Theory, measurement, and nature of abilities. Individual differences in ability, skill, and productivity. Relation of ability to other personality variables.

150. SOCIAL PSYCHOLOGY

Critical analysis of interrelationships between culture and personality. Formation of the social self. Interpersonal relations. Role theory and behavior. (See SO 150.) NCX

160. PSYCHOLOGY OF PERSONALITY

Personality theory and measurement. Development, dynamics, and structure of personality. Problems and enigmas in study of personality, such as ecstasy, aesthetics, psychosomatics. NCX

165. PHYSIOLOGICAL PSYCHOLOGY

Physiological bases of behavior and experience in terms of neural, glandular, and visceral processes. Physiological accompaniments of perception, motivation, emotion, etc. Lectures and laboratory.

170. SYSTEMS, THEORIES, AND MODELS IN PSYCHOLOGY

Origin and development of modern psychology. Structuralism, Functionalism, Behaviorism, Gestalt Psychology in terms of sensation, perception, learning thinking, etc. Miniature systems and models. NCX

180. SPECIAL SEMINAR IN THE PSYCHOLOGY OF PERCEPTION

A series of assigned readings and reports from classic and contemporary sources in the experimental literature on perception. Investigation of special problems. NCX

182. SPECIAL SEMINAR IN THE PSYCHOLOGY OF MOTIVATION

A series of assigned readings and reports from classic and contemporary sources in the experimental literature on motivation. Investigation of special problems. NCX

190. INDEPENDENT RESEARCH

Independent projects for special senior students involving both experimental and theoretical research. NCX

SOCIAL SCIENCES

WITOLD KRASSOWSKI, PH.D., *Director*

The Social Sciences Division in the College of Arts and Sciences includes the Departments of Economics, Political Science, Psychology, and Sociology, and the areas of Anthropology and Geography. The primary objective of the Division is to promote the fullest development of its component disciplines both as separate areas of inquiry and as contributing elements in the interdisciplinary understanding of social phenomena and social problems.

To this end, the several disciplines which comprise the Social Sciences have entered into a cooperative endeavor aimed at achieving the benefits of mutual collaboration, while at the same time assuring to each of the disciplines the fullest possible opportunity and the most propitious environment for intellectual growth and scholarly achievement.

All students majoring in the Social Sciences must fulfill the following essential preprofessional and research courses: one course in mathematical analysis (SS 50), one course in statistics (SS 55 or PS 100), one course in research methodologies.

DIVISIONAL MAJOR IN SOCIAL SCIENCES

The Division offers a major in Social Sciences which combines three of the four social sciences. Students who wish to major in Social Sciences, besides fulfilling the general requirements of the College of Arts and Sciences, must complete the following lower-division courses: 3 courses chosen from: EC 1, PO 1, PS 1, and SO 1; SS 50 and 55. Their upper-division work must include four upper-division courses in one social science, a total of four upper-division courses in two other social sciences for which they have prerequisites, and SS 110. Students participating in the Departmental Scholars Program will be allowed to take SS 190.

The chairman of the department which the student selects as his area of concentration is the student's academic advisor. He must approve the selection of all courses in the social sciences. An average grade of C must be maintained in all courses of the major.

GEOGRAPHY

A limited number of courses in Geography are offered in the Division of Social Sciences.

PRE-LEGAL STUDIES

There is no one best preparation for the study of law. Admissions officers in the best law schools look to breadth of background and quality of work. All concerned with the law and its teaching, however,

agree that the ability to write and to speak with clarity and precision is of paramount importance. A course in accounting is virtually essential. This can be said about other preparation: A broad foundation in the social sciences, coupled with a careful selection of courses in English, history, and speech, is most desirable. The precise selection of courses will vary with the major and with the different needs and aptitudes of the student.

DEPARTMENTAL SCHOLARS PROGRAM

Outstanding students in the Division of Social Sciences will be invited to participate in the Departmental Scholars Programs. These four-year programs will provide students with particularly challenging and stimulating learning experiences corresponding to their academic potential. Students who complete successfully the requirements of the Departmental Scholars Programs will be awarded recognition during graduation and on their university transcripts.

The departments invite freshmen to apply for admission to the Departmental Scholars Programs if they have achieved a high-school grade-point average of 3.5 and a score of 1350 on the Scholastic Aptitude Test. Applicants will be interviewed by professors of their major department. The decision of the chairman of the department determines acceptance for the program.

To remain in the Departmental Scholars Programs the students must maintain an over-all average of B and earn at least a B in all courses required for their major. Students may be invited to join the Departmental Scholars Programs during their stay in college provided they meet the requirements just stated during the two consecutive terms preceding their application for admission to the Program. In order to graduate with the Departmental Scholars Program distinction, students must complete successfully the requirements of the Program during their junior and senior years.

The students involved in the Departmental Scholars Programs will take full advantage of specially developed approaches to learning as well as the most advanced learning techniques. Students participating in the Departmental Scholars Program:

1. Will be expected to take certain advanced courses in the departments of the Division offered only for exceptional students.
2. Will attend special sections in required courses.
3. Will be permitted to take full advantage of independent and seminar study techniques; they will be invited to participate in the senior seminar instituted for outstanding students of the division.
4. Will receive careful and complete attention of the departmental

professors in the design and execution of research projects geared to the individual interests of the student, and they will be encouraged to participate in the departmental research projects, working with, and under the special supervision and guidance of, the professors of their major department.

5. Will be required to initiate, develop, and report on an independent thesis project and complete the Graduate Record Examination in the area of their major.

SOCIAL SCIENCES COURSES (SS)

1. HUMAN GEOGRAPHY

World survey of man's occupation and utilization of the earth. Basic interrelations of human life and elements of natural environment.

4. ECONOMIC GEOGRAPHY

Relation, from the world point of view, of man's industries (agriculture, lumbering, mining and quarrying, manufacturing, transportation, commerce) to the natural environment.

50. MATHEMATICAL ANALYSIS I

An introduction to finite mathematics and application of the concepts to the social sciences.

51. MATHEMATICAL ANALYSIS II

An introduction to mathematical differentiation and integration with application to the social sciences.

55. PRINCIPLES OF STATISTICS

Introduction to statistical methods, techniques of elementary statistical analysis. Nature of data, logic of statistical induction, inherent limitations. Averages, variations, index numbers, etc. NCX

101. POLITICAL GEOGRAPHY

Geographical patterns of major nations; territorial structure, resources, industry, communications, national aspirations. Role of the United States. Providing a base for analyzing international trends.

110. SOCIAL SCIENCE RESEARCH METHODS

Logic of scientific methods in social sciences. Problems of hy-

pothesis testing, development of research design, measurement, data gathering, analysis, and interpretation of findings. NCX

190. SENIOR SEMINAR

An analytical study of major issues and dilemmas characteristic of modern interdependent society. A jointly taught, interdisciplinary seminar. By permission only.

SOCIOLOGY

WITOLD KRASSOWSKI, PH.D., *Chairman*

The scholastic policy of the Department aims at the study of Sociology by stressing the scientific aspects of the discipline rather than the melioristic or all-inclusive philosophical approaches.

Students who wish to make Sociology their major subject, besides completing the other general requirements of the College of Arts and Sciences and the general Social Science requirements (SS 50 and 55), must pass Sociology 1 and 2 with at least a grade of C.

The major program must include seven courses of upper-division work in Sociology or, depending on the academic or professional orientation of the student, in other recommended disciplines in the general area of social and behavioral sciences. All Sociology majors must complete Social Science 110 with at least a grade of C. Sociology 125 and 150 are also required. All other courses selected in the major must have the approval of the Chairman of the Department. The student must maintain at least an average grade of C in the courses in the major.

The basic elements of sociological analysis are contained in Sociology 125, 126, 132, 161, and 170. Social structures and social psychology are presented in Sociology 107, 129, 147, 148, 150, 151, 165, and 166.

Only students in the Departmental Scholars Program and students in the Honors Division are eligible to take the junior and senior intensive reading programs and the senior thesis, Sociology 192, 193, and 198.

SOCIOLOGY COURSES (SO)

1. PRINCIPLES OF SOCIOLOGY

Critical survey of basic elements of sociological analysis: social organization, culture, socialization stratification, etc. Society, social processes, and social institutions.

2. PRINCIPLES OF SOCIOLOGY

Comprehensive analysis of specialized areas of sociological inquiry: the social problems of America. The costs and casualties in an acquisitive society.

11. SOCIETY AND THE INDIVIDUAL

Introduction to social psychology. Social factors involved in attitude and personality change in different cultures. The individual as a functioning segment of social organization.

107. SOCIAL CONTROL

Institutions, organizations, and behavior aimed at the control of deviant behavior. Prisons, mental hospitals, and "self-help" groups contrasted in their impact on deviant behavior.

125. CONTEMPORARY SOCIOLOGICAL THEORY

Critical analysis of contemporary sociological theories. Interrelationships between theory and research problems. Functions of theory, theory formation, and the theories of middle-range. NCX

126. SOCIAL ANTHROPOLOGY

Comparative society. Critical analysis of the development of human society. Growth of modern institutions out of primitive kinship, social and territorial units.

129. THE PROCESS OF COMMUNICATION

Communication as a sociopsychological and cultural process. Communication patterns in small groups, in bureaucracy. Organization, functions, and development of mass media. Comparison of systems.

132. SOCIAL STRATIFICATION

Social classes in local communities and the nation. Intercultural comparisons of class structures. Occupational trends in heterogeneous societies. Problems of occupational stratification.

147. SOCIOLOGY OF INDUSTRY

Social organization of the work-plant society. Work groups and

work relations in formal and informal organizational structures. Industrial conflict: union and management in an interdependent society.

148. SOCIOLOGY OF COMPLEX ORGANIZATIONS

Critical analysis of administrative, economic, and political organizations; their roles in modern societies. Structures, functions, and disfunctions. Leadership in specialized interdependent organizations.

150. SOCIAL PSYCHOLOGY

Critical analysis of interrelationships between culture and personality. Formation of the social self. Interpersonal relations. Role theory and behavior. NCX

151. SOCIOLOGY OF RELIGION

The structure and function of religion in modern society.

161. SMALL GROUPS

The small group as a research technique and as a social process. Interpersonal influence, social learning, and change in group structure. Experimental demonstrations and class problems. NCX

165. DEVIANT BEHAVIOR

Examination of such deviant behavior as crime, mental disorder, and alcoholism. Social factors in the etiology and control of deviant behavior.

166. SOCIOLOGY OF LAW

The law in society and the effects of the legal process on social institutions and behavior. Analysis of social change and the development of Anglo-American law. Law and the behavioral sciences.

170. SOCIAL CHANGE

Significant trends and issues in contemporary American society and in the world. The utility of sociological concepts and principles in understanding contemporary society.

192. JUNIOR INTENSIVE READING PROGRAM

Readings in social psychology with tutorial supervision, seminar work, and independent research activity. Open only to students in the Departmental Scholars Program and in the Honors Division. NCX

193. SENIOR INTENSIVE READING PROGRAM

Readings in sociological theory with emphasis on middle-range theories and theories of complex organizations. Seminar work and independent research. Open only to students in Departmental Scholars Program and Honors Division. NCX

198. SENIOR THESIS

Supervised work for the senior thesis. Open only to students in the Departmental Scholars Program and the Honors Division. NCX

SPEECH AND DRAMA

ROBERT F. SHEA, M.A., *Chairman*

The Department of Speech and Drama offers courses leading to the degree of Bachelor of Arts in Theatre Arts.

The departmental lower-division requirements are: Introduction to Theatre Arts, Acting I, Play Production I and II (Speech and Drama 10, 20, 30, 31).

Students seeking the degree of Bachelor of Arts in Theatre Arts must take History of Theatre and Drama I, II, III (Speech and Drama 140, 141, 142), Criticism, Playwriting, Directing (Speech and Drama 150, 151, 152), and either Scene Design (Speech and Drama 133) or Advanced Acting (Speech and Drama 122).

The Department assists the Clay M. Greene Players in producing and presenting a number of plays each year. During the Summer Session each year the Department, with the assistance of the Department of English, is responsible for the Shakespeare Festival.

SPEECH AND DRAMA COURSES (SD)

1. FUNDAMENTALS OF EXPRESSION

A basic course in oral communication, stressing the practice of extemporaneous speaking. Organization and content are emphasized, as well as the delivery of informative and persuasive talks. Fall, Winter, and Spring terms.

3. LANGUAGE AND THOUGHT

A study of the basis and problems of symbolic communication between the individual and the world, within the individual, and between individuals. Extensive practice in analytical techniques. Winter and Spring terms.

6. DEBATE

Principles and techniques of argumentation as applied to debate. Extensive practice in varied debate situations. Fall term.

10. INTRODUCTION TO THEATRE ARTS

Survey of all the theatre arts, including drama, acting, directing, production arts. Projects in each area to acquaint the student with the potential and problems of each. Fall term.

20. ACTING I

Principles and practice of basic acting technique. Analysis and development of the skills of individual students. Introduction to the creative method. Spring term.

21. ACTING II

Principles and practice of advanced acting technique. Analysis, imagination, psychotechnique, and style. Prerequisite: SD 20. Fall term.

30. PLAY PRODUCTION I

Historical and modern production methods. Exercises in scene design and execution applied to modern theatre; plans, construction drawings, and handling of scenery. Fall term.

31. PLAY PRODUCTION II

Lighting design and execution for the theatre. Projects in theatrical lighting. Application of principles and techniques to actual production. Winter term.

32. PLAY PRODUCTION III

Costuming for the theatre. Projects in design and execution of costumes for actual production in the Theatre. Spring term.

101. ADVANCED SPEECH

Advanced study of principles of oral communication, personal development, audience psychology, speech composition, special speech situations. Prerequisite: SD 1.

105. ORAL INTERPRETATION

Understanding thought and feeling in literature. Communicating

to an audience. Analysis of forms of poetry, prose for oral reading. Fall term.

122. ADVANCED ACTING

A detailed study in theory and practice of the communication of thought and emotion through gestures, movements, and diction for the stage. Includes work in period movement. Fall term.

133. SCENE DESIGN

Art of scene design. Historical periods, styles of design. Exercises in perspective, renderings, drafting plans, and model making. Practice in scene painting and set dressing. Fall term.

140. HISTORY OF THE THEATRE AND DRAMA I

Survey of development of dramatic art and theatre from primitive origins through Renaissance. Critical study of great plays, history of physical theatre, scenery, staging methods, performers. Fall term.

141. HISTORY OF THEATRE AND DRAMA II

Continuation of History I. From neoclassicism to 1900. Winter term.

142. HISTORY OF THE THEATRE AND DRAMA III

Continuation of History II. The Twentieth Century. Spring term.

150. CRITICISM OF DRAMA

Major literary theories of drama from Aristotle to Ionesco as framework for critical evaluation and analysis of dramatic literature. Prerequisites: SD 140, 141, 142. Fall term.

151. PLAYWRITING

Critical analysis of dramatic structure and technique. For students interested in dramatic literature, play directing, and playwriting. Prerequisite: SD 150. Winter term.

152. PLAY DIRECTING

Problems of play directing and skills required of play director. Projects in direction. Prerequisites: SD 20, 21, 30, 31.

160. THEATRE MANAGEMENT

Problems and practices in backstage organization and production management in college, community, and professional theatre. Projects in theatre management techniques. Prerequisites: SD 10, 30, 31.

THEOLOGY

BARTHOLOMEW L. O'NEILL, S.J., S.T.L., *Chairman*

The University's curriculum in theology forms part of the core of Christian liberal education. It surveys the history of God's entry into human experience in the study of the record of this revelation in the Old Testament, the Gospels, and the development of dogma in the framework of the living Church.

Catholic students are required to take three lower-division courses (including Theology 5 and 6) and two upper-division courses in theology.

THEOLOGY COURSES (TH)

5. THE OLD TESTAMENT

Introduction to the individual books. Exegesis of selected passages. Key themes of Old Testament biblical theology. Basic principles of inspiration, inerrancy, literary forms and interpretation.

6. THE GOSPELS

The formation of, and the literary forms in, the individual Gospels. Exegesis of the key themes in the theology of the Synoptics and St. John. The structure of the Church instituted by Christ, the role of faith.

7. THE HISTORY OF CHRISTIANITY I

Development of Christian knowledge from the Acts of the Apostles, through the early Christian writers, creeds, councils, liturgy, theological disputes and dogmatic decrees, up to the Eleventh Century.

10. THE EPISTLES OF ST. PAUL

Study of the sources and structure of St. Paul's writings and the main themes in his theology: the Law, Sin, Justification, God's plan in history, Christ, the Church, the Completion.

107. THE HISTORY OF CHRISTIANITY II

Development of Christian knowledge from the Eleventh Century through the councils, etc., to the present.

111. PRINCIPAL DOGMATIC TRUTHS

The Trinity, the Incarnation, Original Sin, Redemption, Mariology.

112. GRACE AND THE SACRAMENTS

Sanctifying and actual grace, God's presence in human life and man's response. Survey of the seven sacraments in which Christ sanctifies his Mystical Body the Church. Emphasis on the Holy Sacrifice of the Mass and on Christian Marriage.

113. LITURGY AND THE CHRISTIAN COMMUNITY

The nature of the liturgical action, survey of the development of the liturgy. The sacraments considered as acts of the Church's liturgy. Participation in the liturgy as growth in Christian holiness.

122. THE SOCIAL ENCYCLICALS OF THE POPES

A study of the great social documents of the modern popes – Leo XIII, Pius XI, Pius XII, and John XXIII – as sources of Christian and secular morality in the areas of economic and political decision, both national and international.

150. CONTEMPORARY PROBLEMS

Investigation of problems arising from outstanding contemporary writings, selected by the instructor. Readings and discussion. Open only to seniors. Spring term.

151. SPECIAL QUESTIONS

Questions selected in the area of special interest of the instructor. Readings and discussion. Open only to seniors. Spring term.

155. SOCIOLOGY OF RELIGION

The structure and functions of religion in modern society.

FACULTY

*Wilson A. Aldridge, S.J. (1954)
Associate Professor of Classics
A.M., 1937, Gonzaga University; S.T.L., 1944, Alma College.

Gerald L. Alexanderson (1958)
Assistant Professor of Mathematics
B.A., 1955, University of Oregon; M.S., 1958, Stanford University.

Louis I. Bannan, S.J. (1953)
Associate Professor of Education and Philosophy
A.M., 1938, Gonzaga University; S.T.L., 1944, Alma College.

William A. Barker
Professor of Physics
M.S. Physics, California Institute of Technology, 1948; Ph.D. Physics, St. Louis University, 1952.

Noel K. Barstad (1963)
Instructor in Foreign Languages
B.A., 1958, St. Olaf College; M.A., 1962, University of Minnesota.

John Beecher (1963)
Poet in Residence, Lecturer in English
A.B., 1926, University of Alabama; M.A., 1930, University of Wisconsin; L.H.D., 1948, Illinois College.

Edwin A. Beilharz (1963)
Professor of History; Chairman, Department of History
A.B., 1931, Creighton University; A.M., 1934, University of Nebraska; Ph.D., 1951, University of California.

Mario L. Belotti (1959)
Associate Professor of Economics and Business Administration; Chairman, Department of Economics
B.A., 1954, A.M., 1955, Midwestern University; Ph.D., 1960, University of Texas.

S. Ross Bergantz (1959)
Director, Glee Club
B.A., 1950, A.M., 1962, San Jose State College.

Year in parentheses denotes beginning of present service.
*Instructing at Sacred Heart Novitiate.

FACULTY

Marcus R. Berquist (1963)
Assistant Professor, Honors Division
B.A., 1956, College of St. Thomas; Ph.L., 1958, Laval University (Canada).

Lloyd L. Bolton (1932)
Professor of Biology
B.A., 1922, A.M., 1924, University of British Columbia; Ph.D., 1932, Cornell University.

Edwin J. Brown (1951)
Chairman (Emeritus), Department of Education
B.S., 1922, Kansas State Teachers College; A.M., 1925, Ph.D., 1928, Stanford University.

Joseph S. Brusher, S.J. (1957)
Professor of History
A.M., 1932, Gonzaga University; S.T.L, 1939, Alma College; Ph.D., 1943, St. Louis University.

Michael Buckley, Jr. (1955)
Assistant Professor of Mathematics
B.S., 1923, United States Military Academy; M.S.E.E., 1933, Purdue University.

Raymond F. Copeland, S.J. (1959)
Professor of Speech and Theology
AB., A.M., 1927, Gonzaga University; S.T.L., 1935, Alma College; Ph.D., 1950, St. Louis University.

Richard T. Coz, S.J. (1963)
Assistant Professor of Economics
A.B., 1953, M.A., 1954, Gonzaga University.

Audrey M. Davison (1963)
Lecturer in Biology
B.A., 1950, University of Washington; AM., 1963, Stanford University.

Joseph F. Deck (1936)
Professor of Chemistry; Chairman, Department of Chemistry
A.B., 1928, M.S., 1930, St. Louis University; Ph.D., 1932, University of Kansas.

FACULTY

CORNELIUS F. DEENEY, S.J. (1921)
Professor of Theology (Emeritus)
A.B., 1904, A.M., 1905, Gonzaga University; Ph.D., 1923, The Pontifical Gregorian University.

JAMES P. DEGNAN (1963)
Instructor in English
B.A., 1954, Memphis State University; M.A., 1956, University of Notre Dame.

HOWARD R. DELANEY (1963)
Associate Professor of Philosophy
B.S., 1950, Loyola University of Los Angeles; M.A., 1954, Ph.D., 1959, St. Louis University.

HUGH C. DONAVON, S.J. (1929)
Associate Professor of Theology (Emeritus)
A.M., 1919, Gonzaga University.

JOHN B. DRAHMANN (1954)
Associate Professor of Physics; Director, Division of Mathematics and Physical Sciences; Chairman, Department of Physics
B.S., 1943, St. John's University (Minnesota); Ph.D., 1952, St. Louis University.

*J. RICHARD DRAPER, S.J. (1961)
Assistant Professor of History; Associate Dean, College of Arts and Sciences (Novitiate)
A.B., 1951, Gonzaga University; A.M., 1961, University of San Francisco.

WILLIAM T. DUFFY, JR. (1959)
Associate Professor of Physics
B.E.E., 1953, University of Santa Clara; M.S., 1954, Ph.D., 1959, Stanford University.

FRANCIS X. DUGGAN (1962)
Associate Professor of English
A.B., 1958, University of Notre Dame; M.A., 1950, Ph.D., 1960, University of Pennsylvania.

JOHN F. DULLEA, S.J. (1963)
Instructor in Theology
M.A., 1952, Gonzaga University; S.T.L., 1960, University of Innsbruck.

THOMAS E. EWENS (1962)
Instructor in Philosophy
A.B., 1955, Georgetown University.

SELIM EZBAN (1963)
Assistant Professor of Foreign Languages
A.B., 1933, M.A., 1934, Ph.D., 1938, University of Wisconsin.

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*Instructing at Sacred Heart Novitiate.

FACULTY

ELMER D. FAGAN (1962)
Professor of Economics and Business Administration
A.B., 1920, University of Oklahoma; M.A., 1921, Ph.D., 1926, Harvard University.

AUSTIN J. FAGOTHEY, S.J. (1932)
Professor of Philosophy; Chairman, Department of Philosophy
A.B., 1923, A.M., 1924, Gonzaga University; S.T.L., 1932, Weston College; Ph.D., 1949, The Pontifical Gregorian University.

THOMAS N. FAST (1957)
Assistant Professor of Biology
BS., 1949, University of Santa Clara; Ph.D., 1960, Stanford University.

CARL M. FISCHER (1959)
Assistant Professor, Director of Guidance
A.B., 1939, University of Illinois; Ed.M., 1959, Our Lady of the Lake College.

FRANCIS R. FLAIM (1938)
Professor of Biology; Chairman, Department of Biology
A.B., 1936, M.A., 1938, University of Utah; Ph.D., 1956, Stanford University.

GEORGE F. GIACOMINI, JR. (1962)
Assistant Professor of History
B.A., 1956, University of Santa Clara; M.A., 1957, University of California.

JOHN H. GRAY, S.J. (1961)
Assistant Professor of English; Director, Division of Humanities; Chairman, Department of English
A.B., 1948, Gonzaga University; A.M., 1952, Loyola University of Los Angeles; S.T.L., 1956, St. Albert's College (Louvain); Ph.D., 1961, University of London.

ROGER D. GROSS (1961)
Assistant Professor of Speech and Drama
A.B., 1957, University of Oregon; A.M., 1958, University of Minnesota.

JAMES J. HANNAH (1958)
Associate Professor of History
A.B., 1947, St. Paul's College; A.M., 1951, University of Nebraska; Ph.D., 1956, University of California.

MARTHA J. HARDMAN-DE-BAUTISTA (1963)
Assistant Professor of Foreign Languages
B.A., 1955, University of Utah; M.A., 1957, University of New Mexico; Ph.D., 1963, Stanford University.

*DOMINIC J. HARRINGTON, S.J. (1963)
Assistant Professor of Classics
A.B., 1936, A.M., 1937, Gonzaga University; S.T.B., 1944, Alma College.

*Instructing at Sacred Heart Novitiate.

FACULTY

Carl H. Hayn, S.J. (1955)
Associate Professor of Physics
A.B., 1939, A.M., 1940, Gonzaga University; S.T.L., 1948, Alma College; Ph.D., 1955, St. Louis University.

Abraham P. Hillman (1957)
Associate Professor of Mathematics; Acting Chairman, Department of Mathematics
B.A., 1939, A.M., 1940, Brooklyn College; Ph.D., 1950, Princeton University.

William B. Hugle (1963)
Lecturer in Chemistry
Ph.B., 1946, B.S., 1957, The University of Chicago; M.S., 1959, University of Cincinnati.

William R. James (1963)
Assistant Professor, Honors Division
B.A., 1953, University of Nevada; M.A., 1956, San Jose State College.

Stephen Jurika, Jr. (1963)
Lecturer in Geography
B.S., 1933, United States Naval Academy; M.A., 1957, The George Washington University; Ph.D., 1962, Stanford University.

Cyril R. Kavanagh, S.J. (1962)
Assistant Professor of Philosophy
A.B., 1921, A.M., 1922, Gonzaga University; S.T.L., 1930, Colegio de San Ignacio, Sarria, Barcelona, Spain.

*Raymond J. Kelley, S.J. (1958)
Assistant Professor of Classics
A.B., 1944, A.M., 1945, Gonzaga University; Th.B., 1951, Alma College.

*John A. Kelly, S.J. (1963)
Assistant Professor of Ascetical Theology
A.B., 1947, A.M., 1948, Gonzaga University; S.T.B., 1954, Alma College.

Jerome G. Kerwin (1961)
Professor of Political Science; Director, Honors Division
A.B., 1919, Darthmouth College; A.M., 1921, Ph.D., 1926, Columbia University.

Kenneth R. King (1961)
Assistant Professor of Mathematics
A.B., 1951, Michigan State University; M.S., 1956, Purdue University.

Francis J. Koenig, S.J. (1957)
Assistant Professor of Chemistry
A.B., 1942, A.M., 1943, Gonzaga University; M.S., 1955, Ph.D., 1957, St. Louis University.

*Instructing at Sacred Heart Novitiate.

FACULTY

WITOLD KRASSOWSKI (1957)
Associate Professor of Sociology; Director, Division of Social Sciences; Chairman, Department of Sociology
B.Sc., 1952, M.S., 1954, Purdue University; Ph.D., 1963, University of California at Los Angeles.

BERNARD L. KRONICK (1956)
Associate Professor of Political Science; Chairman, Department of Political Science
A.B., 1937, Ph.D., 1953, University of California.

WALTER J. KROPP, S.J. (1956)
Associate Professor of Classics
A.B., 1930, A.M., 1931, Gonzaga University.

WILLIAM E. LANGLOIS (1961)
Lecturer in Physics
B.Sc., 1953, University of Notre Dame; Ph.D., 1957, Brown University.

*CARROLL G. LAUBACHER, S.J. (1961)
Assistant Professor of Music
A.B., 1949, A.M., 1951, Gonzaga University; S.T.B., 1957, Alma College; M.Mus., 1960, New England Conservatory.

RICHARD K. LEEMAN (1962)
Assistant Professor, Honors Division
B.S., 1950, A.M., 1953, Ph.D., 1961, University of Wisconsin.

JEROME B. LONG (1961)
Assistant Professor of Philosophy
B.A., 1950, M.A., 1953, Ph.D., 1962, Fordham University.

CARLOS U. LOPEZ (1963)
Lecturer in Foreign Languages
B.S., 1958, University of Santa Clara; M.A., 1959, University of California.

THEODORE J. MACKIN, S.J. (1958)
Associate Professor of Theology
A.B., 1946, A.M., 1948, Gonzaga University; S.T.L., 1954, Alma College; S.T.D., 1958, The Pontifical Gregorian University.

JOSEPH L. MARTIN, S.J. (1962)
Associate Professor of Theology
B.S.C., 1932, University of Santa Clara; A.M., 1939, Gonzaga University; S.T.B., 1947, Alma College.

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*Instructing at Sacred Heart Novitiate.

FACULTY

NORMAN F. MARTIN, S.J. (1958)
Associate Professor of History in absentia (Jesuit Institute of History, Rome, Italy)

A.B., 1941, A.M., 1942, Gonzaga University; S.T.L., 1948, Colegio Maximo de San Miguel (Buenos Aires); A.M., 1950, Mexico City College; Doctor en Letras, 1957, National University of Mexico.

ROGER D. MCAULIFFE, S.J. (1952)
Assistant Professor of Theology

A.M., 1943, Gonzaga University; S.T.L., 1950, Alma College.

PHILIP T. MCCORMICK (1958)
Associate Professor of Physics

B.S., 1948, Ph.D., 1954, University of Notre Dame.

CHARLES N. R. MCCOY, REV. (1963)
Professor of Political Science

A.B., 1932, Dartmouth College; Ph.D., 1938, The University of Chicago; Ph.D., 1941, Laval University (Canada).

GERALD E. MCDONALD (1962)
Professor of Education; Chairman, Department of Education

A.B., 1947, Boston College; Ed.D., 1955, Stanford University.

JOHN H. MCNAMARA (1963)
Assistant Professor of Sociology

B.A., 1953, University of California at Santa Barbara; M.A., 1958, University of California at Los Angeles.

CHARLES A. MCQUILLAN, S.J. (1956)
Assistant Professor of Philosophy

A.B., 1926, A.M., 1927, Gonzaga University.

DAVID G. MEAD (1963)
Associate Professor of Mathematics

A.B., 1943, Ph.D., 1959, Columbia University.

ETHEL B. MEECE (1961)
Assistant Professor of Biology

B.A., 1942, Western College (Ohio); M.A., 1946, Radcliffe College.

MATTHIAS S. MEIER (1963)
Assistant Professor of History

B.A., 1948, University of Miami; M.A., 1949, Mexico City College (Mexico); Ph.D., 1954, University of California.

JOHN S. MOORING (1963)
Associate Professor of Biology

A.B., 1950, University of California at Santa Barbara; Ph.D., 1956, University of California at Los Angeles.

FACULTY

ELIZABETH J. MORAN (1963)
Lecturer in English
A.B., 1942, Indiana University; M.A., 1963, San Jose State College.

JOHN W. NEUMAYR (1962)
Instructor in Philosophy
A.B., 1952, M.A., 1954, University of Notre Dame; Ph.L., 1961, Ph.D., 1962, Laval University (Canada).

JOSEPH L. NICHOLAS (1956)
Coordinator of Audio-Visual Services
B.A, 1956, University of Santa Clara; MA., 1963, San Jose State College.

JOHN P. O'CONNELL, S.J. (1959)
Counselor
A.B., 1918, A.M., 1919, Gonzaga University.

*HARRY T. OLIVIER, S.J. (1960)
Instructor in Speech
A.B., 1950, A.M., 1951, Gonzaga University; S.T.L., 1958, A.M., 1958, Alma College.

BARTHOLOMEW L. O'NEILL, S.J. (1958)
Professor of Theology; Chairman
A.B., 1925, A.M., 1926, Gonzaga University; S.T.L., 1933, St. Mary's College (Kansas).

WOLODYMYR ORENCZUK (1963)
Lecturer in Foreign Languages
LL.M., 1937, State University of King Jan Kasimir (Poland); LL.D., 1949, Free University (Germany); M.A. in L.S., 1956, Rosary College.

DANIEL A. O'SULLIVAN, S.J. (1958)
Assistant Professor of Philosophy
A.B., 1948, A.M., 1949, Gonzaga University.

*FELTON G. O'TOOLE, S.J. (1953)
Assistant Professor of English
A.M., 1941, Gonzaga University; A.M., 1951, Fordham University.

JOHN B. PATTERSON (1961)
Assistant Professor of Speech and Drama
B.S., 1951, University of Georgia; M.A., 1954, Ohio State University.

ROBERT J. PFEIFFER (1958)
Assistant Professor of Chemistry (on leave)
B.S., 1953, University of Santa Clara; Ph.D., 1958, Cornell University.

ARTHUR T. PHELPS (1958)
Associate Professor of Education; Director, Teacher Education Program
A.B., 1937, A.M., 1940, Canisius College; A.M., 1950; Ed.D., 1956, Columbia University.

*Instructing at Sacred Heart Novitiate.

FACULTY

Joseph J. Pociask, S.J. (1945)
Associate Professor of English
A.B, 1936, A.M., 1937, Gonzaga University; S.T.L., 1943, Alma College.

Dean Pritchett (1961)
Lecturer in English
A.B., 1960, A.M., 1961, San Jose State College.

John J. Quinn (1957)
Assistant Professor of English
B.S., 1950, University of San Francisco; Ph.D., 1956, Stanford University.

Richard J. Roberts, S.J. (1961)
Associate Professor of Political Science
A.B., 1935, University of San Francisco; A.M., 1943, St. Louis University; S.T.L., 1949, Alma College; Ph.D., 1961, St. Louis University.

Joseph A. Russo (1960)
Lecturer in Foreign Languages
A.B., 1934, M.A., 1937, Miami University.

Robert F. Sasseen (1962)
Assistant Professor, Honors Division
A.B., 1957, University of Notre Dame; A.M., 1959, Ph.D., 1961, The University of Chicago.

Richard M. Schmidt (1941)
Assistant Professor of English
A.B., 1935, University of Santa Clara; A.M., 1945, University of Washington.

K. G. Seely (1963)
Instructor in Foreign Languages
B.A., 1956, M.A., 1957, Brigham Young University.

John B. Shanks, S.J. (1961)
Assistant Professor of Philosophy
A.B., 1947, A.M., 1948, Gonzaga University; S.T.L., 1955, Alma College.

Robert F. Shea (1956)
Assistant Professor of Speech and Drama; Director, Division of Creative Arts; Chairman, Department of Speech and Drama
A.B., 1938, Trinity College (Iowa); A.M., 1953, University of South Dakota.

William F. Sheehan, Jr. (1955)
Associate Professor of Chemistry
B.S., 1948, Loyola University (Chicago); Ph.D., 1952, California Institute of Technology.

Peter B. Smith (1962)
Assistant Professor of English
A.B., 1949, A.M., 1950, San Francisco State College.

ROBERT W. L. SMITH (1961)
Assistant Professor of English
A.B., 1947, The University of Chicago; M.A., 1956, Gonzaga University.

RICHARD J. STANEK (1958)
Associate Professor of Psychology; Chairman, Department of Psychology
B.S., 1950, M.A., 1953, Ph.D., 1956, Loyola University (Chicago).

GERHARDT E. STEINKE (1956)
Associate Professor of Foreign Languages
B.A., 1939, The University of Chicago; M.A., 1942, Tulane University; Ph.D., 1954, Stanford University.

RICHARD G. STEVENS (1963)
Assistant Professor, Honors Division
A.M., 1956, Ph.D., 1963, The University of Chicago.

DONALD L. STRANDBURG (1961)
Assistant Professor of Physics
B.S., 1952, Morningside College; Ph.D., 1961, State University of Iowa.

GEORGE J. SULLWOLD, JR. (1962)
Assistant Professor of English
A.B., 1934, M.A., 1936, University of California at Los Angeles; Ph.D., 1958, University of Washington.

IRVING SUSSMAN (1956)
Professor of Mathematics (on leave); Chairman, Department of Mathematics
B.S., 1943, Columbia University; A.M., 1947, The Johns Hopkins University; Ph.D., 1953, University of California.

JAMES E. SWEETERS, S.J. (1958)
Instructor in Theology
A.B., 1948, A.M., 1950, Gonzaga University; S.T.L., 1957, Alma College.

ALEXANDER A. TAIT, S.J. (1956)
Associate Professor of Theology
A.M., 1940, Gonzaga University.

VINCENT H. TALLEY (1963)
Associate Professor, Honors Division
Diploma (Piano and Composition), 1925, Juilliard School of Music; B.S., 1932, Columbia University; M.A., 1943, Harvard University.

JAMES F. TWOHY (1959)
Lecturer in Political Science
A.B., 1907, University of Santa Clara.

FACULTY

Clemens Van Perre (1932)
Associate Professor of Languages (Emeritus)

A.B., 1908, Royal Lyceum (Antwerp); Graduate, 1911, Athenaeum of Antwerp; Graduate, 1913, Royal Conservatory (Antwerp); Graduate, 1913-14, University of Louvain.

Victor B. Vari (1946)
Professor of Foreign Languages; Acting Chairman, Department of Languages

A.B., 1942, San Francisco State College; A.M., 1952, Stanford University; Ph.D., 1961, University of Madrid.

Edward V. Warren, S.J. (1961)
Instructor in English; Director of Summer Session; Director of Extension Division

A.B., 1939, University of California; A.M., 1949, Gonzaga University; S.T.L., 1953, Alma College; A.M., 1957, University of California.

Diana M. Welch (1964)
Artist in Residence

Edna McRae School of Dance, 1945-52; Sadler Wells Ballet School, 1954; John Petri School of Ballet, 1958-60; Diana Morgan Welch Concert Dancers, 1958-64.

Philip B. Welch (1963)
Associate Professor of Arts and Architecture; Chairman, Department of Arts and Architecture

B.A., 1947, Stanford University; M.Arch., 1952, University of Oklahoma; Reg. Arch., 1955, Illinois, 1964, California; N.C.A.R.B. License 1958.

Thaddeus J. Whalen, Jr. (1962)
Assistant Professor of Economics and Business Administration

B.S., 1958, University of Santa Clara.

Tennant C. Wright, S.J. (1964)
Theology

M.A., 1956, Gonzaga University.

III

THE UNIVERSITY OF SANTA CLARA

SCHOOL OF BUSINESS

CATALOG · 1964-1965

SANTA CLARA · CALIFORNIA · 95053

SECTION III

SCHOOL OF BUSINESS

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SCHOOL OF BUSINESS

ADVISORY BOARD

A board made up of outstanding business leaders of the area acts in an advisory capacity for the School of Business. The men who are serving in this position are: F. W. Ackerman, Ransom M. Cook, A. A. Dempsey, J. M. Hait, Charles S. Hobbs, Ernest Ingold, E. D. Maloney, James P. Mitchell, J. B. McCowan, Joseph McMicking, Robert B. Morris, Jr., Peter J. Pasetta, Sidney L. Schwartz, S. L. Sibley, G. J. Ticoulat, and C. K. Wilson.

GENERAL STATEMENT

The School of Business correlates the general educational objectives of the University with preparation in meeting the general and specific problems of industry.

HISTORY

The Board of Trustees established the School of Business as an integral part of the University of Santa Clara in 1926. The four-year curriculum was approved in 1927.

OBJECTIVES

The objectives of the School of Business are to supply professional training for those who are aiming at responsible positions in corporations, in their own businesses, in professional organizations serving business, or in state and federal government agencies; and to provide graduate work at both the master and doctoral levels.

NATIONAL AFFILIATION

The School of Business is accredited by the American Association of Collegiate Schools of Business for both the undergraduate and the graduate programs.

ORGANIZATION

The School of Business is divided into three divisions:

a) Undergraduate (4 years) (B.S.C. Degree).

b) Graduate (M.B.A. and Ph.D. Degrees).

c) Management Center.

There are five departments in the School of Business — Accounting and Statistics, Economics, Finance, Management, and Marketing.

UNDERGRADUATE PROGRAM

The program leading to a degree of Bachelor of Science in Commerce consists of a total of 42 term courses.

During the first two years, extreme specialization is not the aim of the School. Rather, the student is trained in the fundamentals of English, mathematics, economics, accounting, speech, and philosophy so that he will be well prepared to analyze and study the technical and special problems of business.

During the junior and senior years, the course is arranged so that every student will include courses in the major functions found in typical business firms. All students must take courses in finance, marketing, production, administrative practices, accounting, business policy, business law, and ethics.

Special and advanced work is given in accounting, administration, economics, finance, management, marketing, and statistics so that students may specialize in some specific area. As an example, majors in accounting may take the required work to prepare for the Certified Public Accounting examination.

The courses in ethics, philosophy, and science provide the student with the broader fundamental principles necessary for dealing with the industrial system in its social and technical relationships.

Combined Business and Law

The combined degree, by which a student is allowed to substitute the professional courses of the first year of Law School for his senior year in college, is awarded only to students (a) who have done all their undergraduate college work at Santa Clara; (b) who have maintained not less than a B average in the junior year in college; (c) who complete with not less than a C average all the professional courses required in the first year of the Santa Clara School of Law and one course in Ethics approved by the Department of Philosophy; and (d) who present not less than 42 term courses. Such students will be awarded the Bachelor's degree from the School of Business after completing the first year of law.

The School of Business does not award the combined degree to students who complete part of their undergraduate studies elsewhere or who undertake their professional studies in colleges not under the administration of the University.

Method of Instruction

The method of instruction used in the School is one in which the students learn through doing. Cases, problems, and discussions supplement in large measure the lecture method which many schools use.

The students must serve as active participants in class discussions. They must learn how to analyze business problems in a great variety of situations. In so doing, they develop the ability and aptitude to evaluate a business problem and to decide on what course of action to follow.

Entrance Requirements

To qualify for freshman standing in the School of Business, applicants must be graduates of an accredited high school and must present no less than 16 units. The quality of the grades presented must be above average. The prescribed units are as follows:

English	3 units
Foreign language (one language)	2 units
Mathematics (algebra and geometry)	2 units
History	1 unit
Laboratory science	1 unit
Optional, advanced course in foreign language, mathematics, or laboratory science	1 unit

In addition to the prescribed units, it is strongly recommended that the remaining six units should be in solid college preparatory subjects rather than in the terminal and industrial courses.

Transfer Students

Students who transfer to the School of Business from other universities and junior colleges must complete, during their first two years, a minimum of 60 semester or 90 quarter units in order to be given junior status. Included in these units must be 6 semester or 9 quarter units of Principles of Accounting and 6 semester or 9 quarter units of Principles of Economics.

Graduation Requirements

Lower Division

The first two years (freshman and sophomore) of college work are known as the lower division. The work of the lower division supplements that of the secondary schools in establishing a basis for a liberal education and, at the same time, includes work introductory to the professional courses required at the University.

Lower-Division Courses: It should be noted that the recommended program for the first two years is the same for all students. Each student must complete 24 term courses in the lower division.

Freshman Year

First Term

1. English
2. Theology*
3. BA 14 (Mathematical Concepts I)
4. BA 11 (Business and Society), Econ. 16 (American Econ. History), or BA 18 (Business Law)

Second Term

1. English
2. Theology*
3. BA 15 (Mathematical Concepts II), or Physical Science
4. BA 11 (Business and Society), Econ. 16 (American Econ. History), or BA 18 (Business Law)

Third Term

1. Speech
2. BA 16 (Mathematical Concepts III), Physical Science, or, Elective
3. BA 11 (Business and Society), Econ. 16 (American Econ. History), or BA 18 (Business Law)
4. Elective

Sophomore Year

First Term

1. Econ. 1A
2. BA 1A (Fundamentals of Accounting)
3. English 51, Military Science, or BA 20 (Business Law)
4. Philosophy

Second Term

1. Econ. 1B
2. BA 1B (Fundamentals of Accounting)
3. English 51, Military Science, or BA 20 (Business Law)
4. History of Philosophy

Third Term

1. BA 1C (Fundamentals of Accounting)
2. BA 40 (Statistics) or Elective
3. English 51, Military Science, or BA 20 (Business Law)
4. Theology*

*Only Catholic students are required to take courses in Theology.

Upper Division

The primary objective in the upper division is to provide fundamental academic and professional training which will qualify graduates for the responsibilities of business. In other words, the School of Business has as its primary goal the training of professional business men.

The secondary objective is to offer sufficient work in accounting, management, sales and marketing, finance, economics, and statistics so that students who desire to specialize may prepare for careers in these areas.

Requirements: Each student is required, on entering the upper division, to fulfill the following minimum requirements for graduation:

1. At least 18 term courses of upper-division subjects must be completed after fulfilling the requirements of the lower division.
2. Residence of at least one year immediately preceding graduation is required for the granting of any degree.
3. Electives. Subjects not taken as prescribed courses and not included in the student's major and minor sequences may be chosen as free electives to complete the 42 term courses required for graduation.
4. A minimum of 11 courses in Business and Economics must be completed during the junior and senior years.

Substitution for some of the total prescribed units may be allowed in special programs with permission of the Dean.

Required Upper-Division Courses: The course is arranged so that every student must include during his junior and senior years courses in the major functions found in typical business firms.

I. Basic Courses:

During the junior and senior years, the students will be required to take the following basic term courses:

Statistics
Finance
Marketing
Business Organization and Management
Economics of Enterprise
Business Policy

II. Field of Emphasis:

Four courses beyond the introductory course in one field. The following fields of emphasis are approved: Accounting, Economics, Finance, Management, and Marketing (including retailing, sales management, and advertising).

Students who do not wish to elect one of the preceding fields of emphasis may receive permission to elect a general business program.

The above required subjects give the students the training necessary in preparing them to have a broad business outlook. With courses in marketing, industrial management, finance, economics, and accounting in their required program, the students are prepared to grasp and cope with the complicated problems of management. They are not limited in their analysis of these varied problems to any one phase of the operations of a company, but are equipped to consider all aspects.

Junior Year

First Term

1. Major Area
2. Business Administration and Economics Core*
3. Philosophy

Second Term

1. Major Area
2. Business Administration and Economics Core*
3. Philosophy

Third Term

1. Major Area
2. Business Administration and Economics Core*
3. Theology

Senior Year

First Term

1. Major Area
2. Business Administration and Economics Core*
3. Philosophy

Second Term

1. Major Area
2. Business Administration and Economics Core*
3. Theology

Third Term

1. Major Area
2. Business Administration and Economics Core*
3. Elective

*The Business Administration and Economics Core area for the junior and senior years include term courses in: Business Organization and Management (BA 160), Business Policy (BA 162), Economics of Enterprise (BA 159), Finance (BA 123 or BA 121), Marketing (BA 181) and Statistics. (The requirement in Statistics may be fulfilled by taking BA 40 in the sophomore year, or BA 100 in the junior year.)

Areas of Specialization

The term courses below are examples of some of the courses which may be used to satisfy the requirements in the areas of specialization.

Curriculum in Accounting

Dr. John Pagani, *Chairman*
(Acceptable subjects)

BA 101	Statistical Analysis
BA 102	Statistical Analysis
BA 130	Accounting Valuation
BA 131A	Accounting: Proprietorship
BA 131B	Accounting
BA 132A	Accounting Problems
BA 132B	Accounting Problems
BA 132C	Accounting
BA 133	Cost Accounting
BA 134	Accounting Systems
BA 136	Industrial Cost Analysis
BA 137	Auditing
BA 138	Income Taxation

Curriculum in Economics

Dr. L. M. Belotti, *Chairman*
(Acceptable subjects)

Econ. 110	History of Economic Doctrines
Econ. 114	Economic Theory
Econ. 115	Aggregate Economics
Econ. 116	American Economic History
Econ. 119	Public Finance
Econ. 120	Taxation
Econ. 122	Money and Banking
Econ. 128	Business Cycles
Econ. 129	Economic Development
Econ. 150	Labor Problems
Econ. 158	Government and Business
Econ. 180	International Trade

Curriculum in Finance

Dr. D. Robert Papera, *Chairman*
(Acceptable subjects)

BA 119	Public Finance
BA 120	Taxation

Econ. 122	Money and Banking
BA 124	Investments and Investment Institutions
BA 125	Financial Policy
BA 126	The Financial System
BA 127	Problems in Public Finance
BA 129	Finance Seminar
BA 130	Accounting Valuation
BA 135	Analysis of Financial Statements
BA 148	Principles of Insurance
BA 150	Life Insurance

Curriculum in Management and Administration

Dr. Joseph M. Trickett, *Chairman*
(Acceptable subjects)

BA 101	Statistical Analysis
BA 136	Industrial Cost Analysis
BA 147	Industrial Sociology
BA 157	Elements of Management Science
BA 158	Government and Business
BA 163	Production Control
BA 166	Personnel Management
BA 168	Administrative Practices
BA 171	Industrial Psychology
BA 185	Sales Management

Curriculum in Marketing

Dr. Lawrence C. Lockley, *Chairman*
(Acceptable subjects)

BA 101	Statistical Analysis
BA 141	Principles of Insurance
BA 165	Retailing
BA 167	Purchasing
BA 171	Industrial Psychology
BA 182	Marketing Problems
BA 183	Principles of Transportation
BA 184	Advertising
BA 185	Sales Management
BA 186	Salesmanship
BA 199	Marketing Research
Econ. 180	International Trade

GRADUATE PROGRAM

Master of Business Administration Degree

The purpose of the graduate program leading to the degree of Master of Business Administration is to help students develop the attributes of business leadership. The curriculum is focused on the problems of business but is intended to be broad and general, rather than merely vocational. It stresses the significance of the orientation of business to a dynamic society, and the problems of control of the increasingly complex aspects of an industrial economy.

Graduate courses will be offered during four quarters each year, starting in September, January, March, and June. Classes will be scheduled during the late afternoon and evening periods to allow graduate students employed during the day to complete the requirements for the degree of Master of Business Administration.

Entrance Requirements

Requirements for admission for the Master of Business Administration degree give recognition to the differences among candidates in educational background and experience.

The M.B.A. program can be built upon undergraduate work in Engineering, Business, Arts and Sciences, and other areas. A candidate for admission must have a Bachelor's degree from an institution of accepted standing.

To guarantee minimum standards of performance, a student who has completed undergraduate courses in accounting, economics, and/or statistics will be required to pass qualifying examinations in these areas to satisfy the basic requirements in BA 200A, 213, and 230. Undergraduate courses in finance, business law, and marketing may be used to satisfy basic requirements as listed in the Group I courses (BA 220, BA 251, BA 280).

If a student did not complete undergraduate courses in these basic areas, he cannot take the qualifying examinations but must satisfy the requirements by taking the basic courses. Examinations will be administered approximately three weeks before opening of each term. Special arrangements will be made for students coming from a distance.

Instructions for Application

Submit application form in duplicate. (Application forms and transcripts must be on file with the University at least three weeks prior to the starting date of classes.) Enclose a $5 application fee. Checks are to be made payable to the University of Santa Clara.

Before an application can be evaluated, all transcripts of college credit must be on file at the University. One should write directly to the regis-

trar of each school of collegiate grade attended (and listed on your application) and have a transcript sent directly to the University.

Two recommendations are required. Forms to be used for this purpose will accompany the application forms.

Applications and transcripts should be addressed to: Chairman, M.B.A. Program, School of Business, University of Santa Clara, Santa Clara, California. All credentials and transcripts which are submitted to the University become the property of the University.

Tuition and Fees

Application Charge	$ 5.00
This charge is to be sent with each application form and is not refundable.	
Registration Fee	5.00
This fee is payable each quarter of registration regardless of the number of units for which the student is registered. The fee is not refundable.	
Tuition, *per three quarter units*	70.00
Diploma and Graduation Fee	25.00
Payable in quarter in which degree is granted.	

Refund of Tuition

Any student withdrawing prior to and up to the fourth meeting of any regularly scheduled class will receive a refund of one-half of the tuition. *No refunds of tuition will be made subsequent to the fourth meeting. The registration fee is not subject to refund.* When a student withdraws from the University or from a class, he must report to the Administrative Office of the School of Business and fill out a Withdrawal Form. This cannot be done by mail or by telephone but must be done in person.

Degree Requirements

The Master of Business Administration will be granted after completion of a minimum of 45 graduate quarter units of credit beyond the Group I courses (basic requirements). All credits must be earned in graduate courses open only to graduate students. Undergraduate courses may not be substituted in the satisfaction of this requirement.

Residence requirements of the University may be met by completing 36 quarter units of graduate work beyond the Group I courses at Santa Clara within six calendar years.

Academic Status

In each course, the minimum passing grade is C. If, in the opinion of the Committee on Academic Standing of the School of Business, a stu-

dent's work is so poor as to justify the action, or if it is reasonably certain that he does not possess the qualifications necessary for success in the business field, he may be disqualified.

Incompletes

A student's work may be reported incomplete if some essential portion of his work in the course remains unfinished after the final examination. An incomplete becomes a failure unless the unfinished work is completed to the satisfaction of the instructor within a period of four weeks after the beginning of the following quarter.

Acceptance for Candidacy

Permission to register in the School of Business does not in itself imply that the student is accepted or will be accepted as a candidate for an advanced degree. Once a student has completed 18 graduate units beyond the Group I courses, he must petition to be admitted to candidacy for the M.B.A. degree.

If the student is not advanced to candidacy after completing 18 units of graduate work, he will be disqualified and will not be allowed to continue in the M.B.A. program.

Courses Open Only to Graduate Students

Group I. Basic Courses

This group of courses will provide a background in the major fields of Business and will serve as a basis for advanced study. Students coming from a liberal arts or an engineering undergraduate major may find it necessary to take all of these courses. These basic courses are offered as part of the graduate program and will satisfy undergraduate deficiencies. Candidates are not precluded from enrolling in basic and Group II classes where circumstances merit such procedure.

		Units
BA 200A	Statistics	*3*
BA 213	Economics	*3-6*
BA 220	Finance	*3*
BA 230	Accounting	*3-6*
BA 251	Legal Aspects of Business	*3*
BA 280	Marketing	*3*

Group II. Required of All Students (6 units)

(May be taken with Group I courses.)

		Units
BA 205	The Sociology of Management, and/or	3
BA 268	Management of People	3
BA 260	Management and Organization	3

Group III. Required of All Students (24 units)

(May not be taken with Group I courses.)

		Units
BA 200	Statistics for Management (Prerequisite: BA 200A or equivalent)	3
BA 214	Economic Analysis of the Firm (Prerequisite: BA 213 or equivalent)	3
BA 215	Analysis of Business Conditions (Prerequisite: BA 214)	3
BA 221	Financial Administration Management II (Prerequisite: BA 220 or equivalent)	3
BA 231	Accounting for Management I (Prerequisite: BA 230 or equivalent)	3
BA 232	Accounting for Management II (Prerequisite: BA 231)	3
BA 262	Management of Production	3
BA 282	Marketing Management (Prerequisite: BA 280 or equivalent)	3

Group IV. Electives (12 units)

(Courses in Groups I, II, and III must be completed before these courses are taken. The courses listed below are examples of some of the elective courses which may be taken.)

		Units
BA 205	Sociology of Management*	3
BA 206	Data Processing I	3
BA 215	Analysis of Business Conditions	3
BA 216	Forecasting Economics and Business Changes	3
BA 217	Economic Policy	3
BA 222	Dynamics of the Financial System	3
BA 224	Investments Portfolio Management	3
BA 237	Auditing	3
BA 238	Taxation	3
BA 239A	Accounting Problems	6
BA 239B	Accounting Problems	6

*May be taken with Group I courses.

		Units
BA 261	Linear Programming	3
BA 268	Management of People*	3
BA 269	Communications	3
BA 281	Marketing Theory	3
BA 284	Advertising Management	3
BA 289	Marketing Research	3
BA 290	Management Policy	3
BA 291	Management Decision Processes	3

*May be taken with Group I courses.

Group V. Seminar

(One seminar is required of all students)

The seminar offers the student the opportunity to intensify an area of emphasis. Among the seminar requirements there will be a formal written report (or reports) in which the student will explore a topic approved by the instructor.

The following regulations apply to the seminar:

1. A student must complete a minimum of 30 units and all prerequisites before being allowed to register for a seminar. There will be no exceptions to this rule.
2. No student will be allowed to register for a seminar until he has completed a minimum of three courses (beyond the Group I courses) in the area in which he wishes to take a seminar.
3. Full-time students will register for the seminar as directed by their faculty advisors.

Ordinarily, seminars will not be given during the summer semester. Programs should be planned accordingly. It is recommended that the seminar be taken in the last quarter of the student's program.

Alternative Requirement for Group V

On petition, a limited number of students may be permitted to substitute a thesis (BA 299) for the seminar requirement. (Group V.)

THE DOCTOR OF PHILOSOPHY DEGREE PROGRAM IN BUSINESS

The degree of Doctor of Philosophy in business is conferred upon students as an indication of high intellectual achievement. It is intended to prepare students for business or academic work. Emphasis is placed on breadth of understanding and on competence in analysis, rather than on skill in the day-to-day demands of business. Only in the field in which the student writes his dissertation is it possible for him to specialize.

Because of the general nature of the program, students will be able to apply their background knowledge to a wide range of applications and will be able to keep up with the growing body of knowledge surrounding business activity.

The requirements for the degree are expressed in general terms; it is intended that the program retain a high degree of flexibility. Students will be asked to meet the few general requirements of the School of Business, and beyond that, it is expected that the curricular requirements will be adapted to the needs and objectives of the student.

Admission to the Program

Candidates for admission to the program must have earned a baccalaureate degree from an accredited collegiate institution and must establish this record with an official transcript from the institution granting the degree. In addition, the candidate must take the Admission Test for Graduate Study in Business, given by the Educational Testing Service. At the time of his application for admission, the student will receive any other reference material needed. Admission to the graduate program does not assure the candidate continuous registration; he must maintain a satisfactory grade average and must pass the various examinations.

Requirements for the Degree

The degree of Doctor of Philosophy will be awarded on the basis of the successful completion of 90 quarter-hours of course work; the passing of an examination in one language other than English and foreign to the candidate; the passing of oral and/or written examinations covering the various fields included in his particular program; and the writing of an acceptable dissertation. As a prerequisite to graduate courses in business, the candidate for admission must have had course work or experience in the group of courses designated as the core curriculum by the American Association of Collegiate Schools of Business. These fields are accounting, business law, economics, finance, management, marketing, and statistics. The requirement for this core curriculum can be satisfied by placement examinations or by transcript record, depending on the particular areas.

At least one full year of course work must be completed at the University of Santa Clara. Credit for graduate course work taken at other accredited institutions may be allowed on petition to the Graduate Studies Committee of the School of Business.

It must be emphasized, however, that the attaining of the degree of Doctor of Philosophy is not a matter of accumulation of a given number of course credits, but of building a background of knowledge and understanding broad enough and secure enough to allow the candidate to pass

the succession of examinations set for him. Many candidates may feel that additional courses would be advantageous.

Program of Study: After the student has satisfied the requirements for the core curriculum, he must prepare for an examination in the three basic or tool, fields: accounting, economics, and statistics. He will be expected to take 12 quarter-hours in each of these three fields and to submit himself to an oral examination covering these fields.

His guidance will come primarily from his own doctoral committee, which will include his advisor, a representative of the Graduate Studies Committee, and representatives of the departments in which his optional fields lie. This committee, subject to the requirements of the Graduate Studies Committee, will help the candidate adapt the balance of his program to his needs and interests.

The Language Requirement: The candidate will be asked to develop a reading knowledge of a language which is not the native language of the candidate. The purpose of this requirement is to enable the candidate to read the literature in his field in at least one additional language. It is not a conversational language requirement; if the candidate is able to read and get the meaning of literature in his fields of interest, he will have reached the goal set.

The Optional Fields: In addition to the basic, or tool, areas, the candidate will select three fields for intensive study. One of these fields will be the field in which the dissertation lies. Typically, the fields will be selected from the following list: accounting, economics, finance, management, marketing, sociology, and statistics. For those students for whom a broader selection is desirable, one of the three may be selected from outside the offerings of the School of Business. The student's doctoral committee will guide him in such a selection. When the student's needs seem to his doctoral committee to make it advisable, the student may present only two optional fields, but cover them more intensively. When only two fields are to be presented, both must lie within the offerings of the School of Business.

The candidate must submit himself to a general examination before his doctoral committee, covering the optional fields and such parts of the basic fields as seem relevant. Typically, it is expected that the candidate would submit himself for this examination before he undertakes the preparation of his dissertation. The nature of this examination will be determined by the student's doctoral committee. It may be oral, written, or partially oral and partially written, at the discretion of the student's doctoral committee.

The Dissertation Requirement: The dissertation for the degree of Doctor of Philosophy is expected to constitute a contribution to knowledge. It must be an original work, requiring both research and analysis. It must be written in clear, grammatical, and forceful English, type-

written or reproduced by a method which will allow the document to be microfilmed clearly, and accompanied by a concise summary of about ten to fifteen pages. At least one original and two copies must be submitted to the student's doctoral committee. The members of this committee and any others invited by the committee will examine the candidate orally on the dissertation.

If the candidate passes this final examination, he will have completed all requirements for the degree of Doctor of Philosophy in Business.

Tuition Costs

Course tuition is $70 for each 3 quarter-unit course. The requirements for the degree of Doctor of Philosophy are for 90 quarter-units of course work, of which at least one-half must be taken in residence at the University of Santa Clara. In addition, there is a charge for individual supervision and counseling equivalent to 45 quarter-units. This last sum will be payable as tuition after course requirements are completed. There is an Application Fee of $5, which is not refundable, and a Registration Fee of $5 payable for each quarter the student is in residence at the University of Santa Clara, and a Graduation Fee of $25.

Summary of Ph.D. Degree Requirements

The following requirements must be satisfied before a doctoral candidate will be recommended for the Doctor of Philosophy degree.

1. Demonstrated competence in the areas of general requirements through course work and oral examination.
2. Passing of a foreign language examination. The candidate must demonstrate an ability to utilize the foreign language as a meaningful research tool.
3. Completion of the recommended units of graduate work beyond the baccalaureate degree.
4. The passing of comprehensive written or oral examinations in each of the fields of specialization selected by the candidate.
5. Completion of a dissertation acceptable to the doctoral committee established for the candidate. The dissertation must reflect the candidate's ability to conceive and execute independent scholarly research which contributes to knowledge in business administration. The dissertation must be completed within a five-year period from the date of passing the general examination.

THE MANAGEMENT CENTER

The Management Center at the School of Business, University of Santa Clara, was organized in 1957 to provide programs of continuing education for executives, managers, and supervisors. Over 100 different seminars, institutes, workshops, and conferences have been conducted for people coming from all levels of management and from public and private, profit and nonprofit institutions. Many of these programs are initiated by the University, but many others are instigated by a single company, by a group of companies, or by a professional association.

Although the Center was established as an adjunct of the School of Business, the educational and professional talents of all parts of the University are integrated in these programs.

The more important programs which are offered each year include the following:

Management Development Program—(Offered Fall, Spring and Summer – a twelve-day program) for middle and upper management people.

Foremanship and Supervision Program – 30 weeks, Fall to Spring.

Program in Hospital Management – 4 or 5, eight-week seminars throughout the year.

Program in Municipal Management –4 or 5, eight-week seminars throughout the year.

Western Institute for Organization Management, conducted in cooperation with the Chamber of Commerce of the United States – a one-week each year, for six years, intensive program for Chamber of Commerce and Association executives.

Telephone Management Development Program, conducted in cooperation with the Independent Telephone Companies of California – a two-week intensive program for executives from independent telephone companies.

Work Simplification Roundtable – a one-week intensive program for production supervisors and office supervisors in latest methods of work simplification and work scheduling.

BUSINESS ADMINISTRATION COURSES (BA)

Undergraduate Courses

1A. FUNDAMENTALS OF ACCOUNTING

The study of accounting in the planning and operation of business enterprise with special reference to the merchandising cycle.

1B. FUNDAMENTALS OF ACCOUNTING

A continuation of 1A with emphasis on the cost cycle.

1C. FUNDAMENTALS OF ACCOUNTING

A continuation of 1B with emphasis on application of accounting information in the solution of business problems.

11. BUSINESS AND SOCIETY

The American business system in theory and practice; political, social, and economic forces shaping the environment of the business organization.

12. AMERICAN ECONOMIC HISTORY

A study of the economic history of the United States, with special reference to problems arising from the factory system and large-scale production.

14. MATHEMATICAL CONCEPTS I

The basic concepts of mathematics as applied to business and economics are emphasized.

15. MATHEMATICAL CONCEPTS II.

Continuation of Mathematical Concepts I.

16. MATHEMATICAL CONCEPTS III

Continuation of Mathematical Concepts II.

18. BUSINESS LAW

The nature and purpose of law, with emphasis on contracts, agency and sales, negotiable instruments, bailments and carriers, and property.

20. BUSINESS LAW

A continuation of 18, with emphasis on partnerships, corporations, bankruptcy, real estate, insurance, and suretyship.

40. PRINCIPLES OF STATISTICS

An introduction to the techniques of analyzing quantitative techniques, with emphasis on basic statistical methods.

100. STATISTICS

Basic concepts and methods of statistics, including descriptive statistics, significance tests, estimation, sampling, and correlation. Not open to students who took BA 40, Principles of Statistics.

101. STATISTICAL ANALYSIS

Application of the methods of basic least squares, with particular reference to the problems of multiple, partial, and curvilinear correlation. Prerequisite: BA 100.

102. STATISTICAL ANALYSIS

The principles of statistical inference are considered, together with the problems of small samples, tests of significance, statistical estimation, contingency tables, and analysis of variance and covariance. Prerequisite: BA 101.

103. OPERATION RESEARCH

Quantitative techniques used in the solution of economic and business problems.

119. PUBLIC FINANCE

A course in Fiscal Policy. An analysis of the economic effects of government expenditure and government borrowing upon economic growth and stability.

120. TAXATION

An analysis of the shifting and incidence of taxation and of the economic effects of the principal types of taxation upon economic growth and stability.

121. CORPORATION FINANCE

Financial Organization; Instruments of Enterprise Finance; Promotion and Sale of Securities. Problems of financing growth and expansion. Financial readjustments.

123. FINANCIAL MANAGEMENT

Primary emphasis on financial analysis, decisions, and policies related to the management of working capital and the sources of short-term financing.

124. INVESTMENTS AND INVESTMENT INSTITUTIONS

Nature of investment institutions and the development of their investment programs in practice and theory.

125. FINANCIAL POLICY

Emphasis placed on financial analysis and theory pertinent to financial structure, capital structure, dividend policy, cost of capital, capital budgeting, and investment policy and valuation.

126. DYNAMICS OF THE FINANCIAL SYSTEM

Role and function of financial institutions, financial flows, interest rate structures, money, and capital markets. The implications for the formulation of business financial policy will be highlighted.

127. PROBLEMS IN PUBLIC FINANCE

A continuation of course 120. Attention is given to current problems in fiscal matters.

128. BUSINESS FLUCTUATIONS

A study of the nature and causes of instability in an industrial private enterprise economy, followed by an appraisal of (1) theoretical explanations of why they occur; and (2) proposed remedies.

129. SENIOR FINANCE SEMINAR

Students study and discuss selected topics in financial management, theory, and research. The selected topics will be partially determined by interests of the seminar members. Emphasis is placed on discussion of a paper and individual reading.

130. ACCOUNTING VALUATION

The theory and technique applied in the valuation of assets and liabilities in the preparation of balance sheets and profit and loss statements. Prerequisite: BA 1B.

131A. ACCOUNTING: PROPRIETORSHIP

Problems arising from the existence of more than one proprietor in an enterprise, as well as the technique and theory underlying the accounting for interests in the net worth of an enterprise. Prerequisite: BA 130.

131B. ACCOUNTING

Continuation of 131A.

132A. ACCOUNTING PROBLEMS

Accounting theory and procedures involved in specialized situations. Bankruptcy, installment sales, public accounts, consolidation, etc. Prerequisite: BA 131.

132B. ACCOUNTING PROBLEMS

A review course in the approach to and solution of types of accounting problems appearing in professional examinations. Prerequisite: BA 132A

132C. ACCOUNTING

Continuation of 132B.

133. COST ACCOUNTING

Particular emphasis is on industrial concerns, but application

to trading concerns, both wholesale and retail, is considered. Prerequisite: BA 1B.

134. ACCOUNTING SYSTEM

The theoretical and practical problems involved in setting up accounting systems, with special reference to the prompt preparation of reports for the use of management. Prerequisite: BA 131.

135. ANALYSIS OF FINANCIAL STATEMENT

Emphasis is placed on statistical interpretation of the typical financial statements and interim reports prepared for the use of management. Prerequisite: BA 1B.

136. INDUSTRIAL COST ANALYSIS

Standard costs and budgetary techniques for cost control. Cost and profit analyses for decision-making purposes, including direct costing, profit-volume analysis, and break-even analysis. Prerequisite: BA 21.

137. AUDITING

This course covers the techniques of external auditing, which are based upon the purpose of an audit and upon the conventional standards to which these techniques should conform.

138. INCOME TAXATION I

Federal income tax practice and theory applied to the determination of tax liability of the individual. Similarities and differences, when appropriate, are indicated for partnerships and corporations.

139. INCOME TAXATION II

Federal income tax theory and practice applied to the determination of tax liability of corporations, partnerships, estates, trusts, and gifts.

140. CONTROLLERSHIP

The control, function, concepts, and applications as used throughout a business.

141. BUDGETING

A study of the preparation and the use of business budgets. Work in the course consists of the preparation of sales, production, materials, overhead, selling expense, and cash budgets.

143. MANAGERIAL ACCOUNTING

The development of the accounting cycle and its application to manufacturing and merchandising organizations.

147. SOCIOLOGY OF MANAGEMENT

Consideration of formal and informal groups and organizations in industry.

148. PRINCIPLES OF INSURANCE

A survey course to acquaint the student with the general principles of insurance and their application to the various branches of the field.

150. LIFE INSURANCE

Studies of the theoretical concepts of the business and personal uses of life insurance and annuities.

157. THE ELEMENTS OF MANAGEMENT SCIENCE

Modern quantitative concepts in management and their application to problems in different functional areas of business administration. Requires familiarity with basic mathematical procedures.

158. GOVERNMENT AND BUSINESS

A study of federal and state economic powers and how they have been used to promote and regulate business activity.

159. ECONOMICS OF ENTERPRISE

An exposition of the principles and techniques of the price theory, with particular emphasis on their significance for the operations of individual firms.

160. ORGANIZATION AND MANAGEMENT

The nature and meaning of management work, the major areas of management operation, concepts of organization and their applications, departmental and interdepartmental organization and relationships.

162. BUSINESS POLICIES AND MANAGEMENT

A study of the interrelationship and coordination of prior functional and managerial courses leading to the formulation and administration of policy. Comprehensive cases comprise the basic material.

163. PRODUCTION CONTROL

The problem of the production of goods. Factors which aid modern productivity. Coordination of sales and manufacturing.

164. TIME STUDY AND MOTION ANALYSIS

Measurement of labor. Operation analysis. Motion study. Process charts, laws of motion economy.

165. RETAILING

A study of trends in retailing, and of the forces of competition which constantly introduce dynamic change into retailing. Prerequisite: BA 181.

166. PERSONNEL ADMINISTRATION

An intensive review of the role and functions of the personnel department in business organizations, with particular emphasis on wage payment and incentive plans and union-management relations.

167. PURCHASING

The problems of procuring and coordinating a flow of raw materials, parts, and supplies with the needs of production and operation of industrial and commercial organizations. Prerequisite: BA 181.

168. ADMINISTRATIVE PRACTICES

A study of cases on human relations in business. The objective of the course is to increase each individual's ability to work effectively with others.

171. INDUSTRIAL PSYCHOLOGY

Psychological principles applied to industrial and business settings, with particular emphasis on sociopsychological aspects of labor-management relations and the motivational factors of job satisfaction and performance.

181. PRINCIPLES OF MARKETING

An exploration of the nature of marketing, the analysis of marketing institutions, and the relationship between demand and marketing.

182. PRINCIPLES OF MARKETING

A continuation of 181. A study of pricing policies, product and sales planning, and public regulation of marketing. Prerequisite: BA 181.

183. PRINCIPLES OF TRANSPORTATION

An economic analysis of forms of commercial transportation in the United States. The particular problems of rail, water, motor, air, and pipeline transportation are considered.

184. ADVERTISING

An analysis of the marketing psychological and social aspects of advertising. Prerequisite: BA 181.

185. SALES MANAGEMENT

An exploration of the systematic management of marketing activities, including the coordination of production and sales, product planning, and the administration of sales forces. Prerequisite: BA 181.

189. MARKETING RESEARCH

A study of the application of marketing research methodology to the solution of business problems and of the survey method as used in marketing research. Prerequisites: BA 181, BA 182, and Senior standing.

199. UNDERGRADUATE RESEARCH PAPER

Graduate Courses

(Open to Graduate Students Only)

200. STATISTICS FOR MANAGEMENT (3)

The use of statistics and the results of statistical method in the analysis of business problems concerned with control, finance, marketing, and production.

200A. STATISTICS – PRINCIPLES (3)

Statistical methods used in business; frequency distribution analysis; time series analysis; simple correlation; index numbers.

201. STATISTICS – CORRELATION (3)

Particular emphasis on the problems of multiple, partial, and curvilinear correlation.

202. STATISTICS – INFERENCE (3)

Statistical inference with analysis of small samples, tests of significance, and variance and covariance.

205. THE SOCIOLOGY OF MANAGEMENT (3)

Analysis of social roles and relationships within business.

206. DATA PROCESSING I (3)

Principles and practices in data processing.

207. DATA PROCESSING II (3)

Continuation of 206.

209. SEMINAR IN SOCIOLOGY OF MANAGEMENT (3)

210. SEMINAR IN THE DEVELOPMENT OF ECONOMIC THOUGHT (3)

211. SEMINAR IN MATHEMATICAL ECONOMICS (3)

211A. ECONOMIC ANALYSIS (3)

An intensive study of micro- and macroeconomics pertaining to the business environment.

211B. ECONOMIC ANALYSIS (3)

A continuation of 211A.

212. SEMINAR IN ECONOMETRICS (3)

213. ECONOMIC PRINCIPLES (3)

A review of basic economic principles concerned with pricing and the level of output.

214. ECONOMIC ANALYSIS OF THE FIRM (3)

An advanced analysis of the application of economic theory to the formulation of business policies and plans. Prerequisite BA 213 or equivalent.

215. ANALYSIS OF BUSINESS CONDITIONS (3)

An advance analysis of aggregate economic theory with particular emphasis upon economic forces which influence the level of business activity. Prerequisite: BA 213 or equivalent.

216. MACRODYNAMICS (3)

An analysis of the fundamental factors responsible for economic fluctuations and growth, together with a study of tools and techniques of measuring and forecasting business changes. Prerequisite: BA 215.

217. ECONOMIC POLICY (3)

An advanced analysis of public policies designed to effect the size, the composition, and the distribution of the nation's wealth and income. Prerequisite: BA 214 and 215.

218. SEMINAR IN AGGREGATE ECONOMICS (3)

219. SEMINAR IN INDUSTRIAL ORGANIZATION (3)

220. FINANCIAL MANAGEMENT I (3)

Primary emphasis on financial analysis, decisions, and policies related to the management of cash, accounts receivable, and inventory and the problems of generating short-term sources of finance. Prerequisite: BA 230 or equivalent.

221. FINANCIAL MANAGEMENT II (3)

Emphasis placed on financial analysis and theory pertinent to financial structure, capital structure, dividend policy, cost of capital, capital budgeting, and investment policy and valuation. Prerequisite: BA 220 or equivalent.

222. DYNAMICS OF THE FINANCIAL SYSTEM (3)

Role and functions of financial institutions, financial flows, interest rate structures, money and capital markets. The implications for the formulation of business financial policy will be highlighted. Prerequisite: BA 221.

223. SEMINAR IN FINANCE (3)

Prerequisite: BA 221 and consent of Instructor.

224. INVESTMENT PORTFOLIO MANAGEMENT (3)

Nature of financial institutions and the development of their investment programs and policies both in practice and theory. Prerequisite: BA 221.

225. SEMINAR IN FINANCIAL RESEARCH (3)

228. SEMINAR IN MONETARY THEORY (3)

229. SEMINAR IN ECONOMIC DEVELOPMENT (3)

230. ACCOUNTING PRINCIPLES (3)

Analysis of accounting techniques.

231. ACCOUNTING FOR MANAGEMENT I (3)

Analysis, interpretation, and application of accounting techniques for managerial decision making.

235. CONTROLS FOR MANAGEMENT I (3)

An advanced course in the use of accounting data and techniques for managerial purposes.

234. SEMINAR IN ACCOUNTING (3)

235. CONTROLS FOR MANAGEMENT II (3)

Covers the concepts and applications of controls throughout a business organization. Emphasis is placed on control philosophies and concepts and the working tools of control.

236. CONTROLS FOR MANAGEMENT II (3)

Continuation of Controls for Management I with emphasis on control applications.

237. AUDITING (3)

Evaluations of principles and practices in auditing and auditing procedures.

238. INCOME TAXATION (3)

The practice of tax accounting.

239A. ACCOUNTING PROBLEMS (3)

Intensive study of complex accounting problems.

239B. ACCOUNTING PROBLEMS (3)

A continuation of 239A.

240A. ACCOUNTING IN BUSINESS (3)

An intensive study of financial and cost accounting from the standpoint of management.

240B. ACCOUNTING IN BUSINESS (3)

A continuation of 240A.

242. ACCOUNTING FOR MANAGEMENT III (3)

Application of accounting in the management of enterprise.

243. ACCOUNTING FOR MANAGEMENT IV (3)

A continuation of 242.

249. PAPER IN ACCOUNTING (3)

251. LEGAL ENVIRONMENT OF BUSINESS (3)

An examination of the law and its nature, formation, and application to business by the executive, legislative, and judicial branches of government.

260. MANAGEMENT AND ORGANIZATION (3)

The meaning and nature of administrative organization, basic and modern management concepts, the dimensions of management activities, functional relationships, and problem of integration and communication.

261. LINEAR PROGRAMMING (3)

Application of theoretical concepts in planning.

262. MANAGEMENT OF PRODUCTION I (3)

An analysis of production problems and the methods used in reaching decisions and recommending courses of action.

263. MANAGEMENT OF PRODUCTION II (3)

Continuation of Management of Production I, with emphasis on application of analytical methods.

264. SEMINAR IN MANAGEMENT (3)

265. OPERATIONS RESEARCH I (3)

Theoretical and applied study of quantitative techniques used in the solution of economic and business problems.

266. OPERATIONS RESEARCH II (3)

Continuation of Operations Research I.

268. THE MANAGEMENT OF PEOPLE (3)

Management problems concerning people at work; work relationships, maintaining high-level performance, individual and group leadership.

269. COMMUNICATIONS (3)

The sociopsychological principles (and the functional and dysfunctional aspects) of the communication process with particular emphasis on communication patterns and barriers in small groups and large-scale organizations.

270. INTERNATIONAL MANAGEMENT (3)

An analysis of problems associated with international business organizations.

271. SEMINAR IN ORGANIZATION THEORY (3)

273. SEMINAR IN ORGANIZATIONAL BEHAVIOR (3)

280. MARKETING MANAGEMENT I (3)

Analysis of principles and methods of marketing from the viewpoint of management through case discussion.

281. MARKETING THEORY (3)

Critical treatment is given to the development of a theoretical basis of marketing and to the economic aspects of marketing. Prerequisite: BA 282.

282. MARKETING MANAGEMENT II (3)

Economics of pricing, product and sales planning, and public regulation of marketing are considered. Prerequisite: BA 280.

283. SEMINAR IN MARKETING (3)

284. ADVERTISING MANAGEMENT (3)

A consideration of the coordination of advertising with other sales promotional tools. Prerequisite: BA 282.

285. SEMINAR IN MARKETING THEORY (3)

286. MARKETING INSTITUTIONS (3)

A study of the history and economics of the various institutions through which goods pass between production and consumption. Prerequisites: BA 280 and BA 282.

288. SEMINAR IN INTERNATIONAL ECONOMICS (3)

289. MARKETING RESEARCH (3)

The application of research methodology to the solving of marketing problems, and the application of marketing research to management thinking. Prerequisite: BA 282.

290. MANAGEMENT POLICY (3)

The study of the development of objectives, policies, and organizational structure of businesses by means of case discussion. Limited to students in the final semester of work for the M.B.A.

291. MANAGEMENT DECISION PROCESSES (3)

An advanced analysis of the decision process under conditions of uncertainty. Methods and instruments of analysis are applied to a variety of management problems.

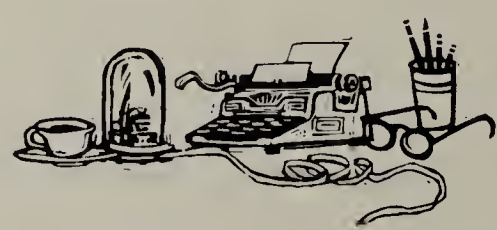
298. INDEPENDENT STUDY (3)

Individual research projects. (Consent of the faculty must be obtained before enrollment for the course.)

299. MASTER'S THESIS (3)

An independent investigation in some business area of specialization. (Required: Consent of the faculty.)

399. PH.D. DISSERTATION



ECONOMICS

Undergraduate Courses

1A-
1B. PRINCIPLES OF ECONOMICS

An introduction to general principles, terminology, and methods of analysis essential to an understanding of modern economic processes and problems.

15. RESOURCES AND INDUSTRIES

A study of the meaning, nature, and availability of resources and their relationship to human wants and social objectives.

16. AMERICAN ECONOMIC HISTORY

A study of the economic history of the United States, with special

emphasis upon our basic economic organizations, such as the business enterprise, the labor union, and the economic functions of government.

110. HISTORY OF ECONOMIC DOCTRINES

A study of the evolution of economic ideas and their influence on the development of economic practices.

111. MATHEMATICAL ECONOMICS

The formulation and evaluation of economic theories by the use of mathematical methods.

112. ECONOMETRICS

The application of mathematical and statistical methods to the analysis of economic data.

113. INDUSTRIAL ORGANIZATION

A microanalysis of the structure, conduct, and performance of American industry.

114. PRICE THEORY

The formulation and explanation of the theory of output, costs, and product prices and of the theory of the employment of and returns to the factors of production.

115. AGGREGATE ECONOMIC THEORY

An analysis of the level of national income and its determinants.

116. ECONOMIC DEVELOPMENT OF THE UNITED STATES

An analysis of the principal factors governing the growth and expansion of the American economy since 1800.

117. ECONOMIC DEVELOPMENT OF EUROPE

A study of the preindustrial environment and industrial growth patterns of the western European countries.

118. COMPARATIVE ECONOMIC SYSTEMS

A comparison of free market economies with partially and fully planned economies.

119. PUBLIC FINANCE

An analysis of public expenditures, public revenues, and public debt with particular emphasis upon their effects on the economy.

120. TAXATION

An analysis of the shifting, incidence, and economic effects of the various forms of taxation.

122. MONEY AND BANKING

A theoretical, institutional, and historical approach to the study of money and banking, with particular emphasis upon the relationship between the monetary and banking system and the rest of the economy.

128. BUSINESS FLUCTUATIONS

A study of the nature and causes of economic instability in an industrial economy.

129. ECONOMIC DEVELOPMENT

An analysis of the historical and theoretical context underlying present efforts to increase the rate of economic growth in underdeveloped countries.

150. LABOR ECONOMICS

A study of labor productivity, income, and employment and how they are affected by labor organizations and labor legislation.

159. ECONOMICS OF ENTERPRISE

An analysis of cost and price relationships in the individual firm in the industry, and in the economy.

180. INTERNATIONAL ECONOMICS

An analysis of the theory of international trade, of problems in balance of payments adjustments, and of international economic policies.

Graduate Courses

(Open to Graduate Students only)

210. SEMINAR IN THE DEVELOPMENT OF ECONOMIC THOUGHT (3)

211. SEMINAR IN MATHEMATICAL ECONOMICS (3)

212. SEMINAR IN ECONOMETRICS (3)

213. ECONOMIC PRINCIPLES (3)

A review of basic economic principles concerned with pricing and the level of output.

214. ECONOMIC ANALYSIS OF THE FIRM (3)

An advanced analysis of the application of economic theory to the formulation of business policies and plans. Prerequisite: Econ. 213 or equivalent.

215. ANALYSIS OF BUSINESS CONDITIONS (3)

An advance analysis of aggregate economic theory, with particular emphasis upon economic forces which influence the level of business activity. Prerequisite: Econ. 213 or equivalent.

216. MACRODYNAMICS (3)

An analysis of the fundamental factors responsible for economic fluctuations and growth, together with a study of tools and techniques of measuring and forecasting business changes. Prerequisite: Econ. 215.

217. ECONOMIC POLICY (3)

An advanced analysis of public policies designed to affect the size, the composition, and the distribution of the nation's wealth and income. Prerequisites: Econ. 214 and Econ. 215.

218. SEMINAR IN AGGREGATE ECONOMICS (3)

219. SEMINAR IN INDUSTRIAL ORGANIZATION (3)

228. SEMINAR IN MONETARY THEORY (3)

229. SEMINAR IN ECONOMIC DEVELOPMENT (3)

288. SEMINAR IN INTERNATIONAL ECONOMICS (3)

Prerequisite for all Seminars: See course announcement.

FACULTY

O. Robert Anderson (1942)
Professor of Business Administration
B.A., 1934, University of Washington; C.P.A., 1941, State of Oregon; M.B.A., 1942, University of Washington.

Lorenzo M. Belotti (1959)
Associate Professor of Economics; Chairman, Department of Economics
B.A., 1954, Midwestern University; A.M., 1955, Ph.D., 1960, University of Texas.

Louis F. Boitano (1947)
Associate Professor of Business Administration
B.S.C., 1947, University of Santa Clara; C.P.A., 1947, State of California.

James B. Boulden (1961)
Associate Professor of Management
B.S., 1951, University of Illinois; B.B.A., 1954, Baylor University; M.S., 1955; D.B.A., 1958, Indiana University.

Philip H. Brunstetter (1963)
Associate Professor of Management
B.A., 1942, Rutgers University; M.A., 1949, Ph.D., 1956, Columbia University.

Edward W. Butler (1962)
Professorial Lecturer in Management
B.S.M.E., 1924, Stanford University.

B. Ballard Cheatham (1964)
Instructor in Business Administration
B.S., 1933, U.S. Naval Academy; M.A., 1963, Stanford University.

Eugene J. Corman (1961)
Assistant Professor of Business Administration
C.P.A., 1956, State of California; B.S.C., 1961, M.B.A., 1963, University of Santa Clara.

Richard T. Coz, S.J. (1963)
Assistant Professor of Economics
A.B., 1953, M.A., 1954, Gonzaga University; Candidate for Ph.D., University of North Carolina.

Charles J. Dirksen (1938)
Professor of Business Administration; Dean, School of Business
B.S.C., 1935, M.S.C., 1938, St. Louis University.

Elmer D. Fagan (1962)
Professor of Business Administration
A.B., 1920, University of Oklahoma; A.M., 1921, Ph.D., 1926, Harvard University.

Paul V. Harrell (1963)
Instructor in Business Administration
B.S., 1943, M. in Accounting, 1960, University of California at Los Angeles; C.P.A., 1961, State of California.

FACULTY

Harry P. Hartkemeier (1960)
Professor of Business Administration

B.S., 1927, University of Louisville; A.M., 1928, Harvard University; Ph.D., 1930, The University of Chicago.

Frank X. Hodgson (1964)
Associate Professor of Business Administration

University of Santo Tomas, B.A., 1945; Cornell University, M.S.C., 1956; Michigan State University, Ph.D., 1961.

Robert F. Jacobs (1961)
Lecturer in Business Administration

LL.B., 1951, University of Santa Clara.

Eliot Jones (1952)
Professor of Business Administration

A.B., Vanderbilt; A.M., Ph.D., Harvard University.

Joseph P. Kelly (1939)
Assistant Professor of Business Law

Ph.B., 1933, Holy Cross College; J.D., 1936, LL.M., 1939, New York University.

Chaiho Kim (1964)
Assistant Professor of Business Administration

B.A., 1958, Ouachita College; M.S., 1959, Ph.D., 1963, Columbia University.

Witold Krassowski (1957)
Associate Professor of Sociology; Chairman, Department of Sociology

B.Sc., 1952, M.S., 1954, Purdue University; Ph.D., 1963, University of California at Los Angeles.

Lawrence C. Lockley (1960)
Professor of Business Administration; Chairman, Department of Marketing

A.B., 1920, A.M., 1921, University of California; A.M., 1928, Ph.D., 1931, Harvard University.

Charles F. Louie (1963)
Assistant Professor of Business Administration

B.S., 1954, M.B.A., 1955, Ph.D., 1963, University of California.

John R. Lowry (1962)
Assistant Professor of Business Administration

B.S., 1953, West Virginia University; M.B.A., 1957, Ph.D., 1962, University of Pittsburgh.

*Peter F. McLoughlin (1963)
Associate Professor of Business Administration

B.A., 1951, University of British Columbia; Ph.D., 1959, University of Texas.

Seymour H. Miller (1964)
Associate Professor of Business Administration

B.A., 1939, University of Chicago; Ph.D., 1957, Columbia University.

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*On leave of Absence 1964-1965

FACULTY

Joseph F. X. Monasta (1948)
Assistant Professor of Business Administration
A.B., 1936, Anselm College; M.B.A., 1948, Stanford University.

Dwayne Orton (1961)
Professorial Lecturer in Business Administration
A.B., 1926, University of Redlands; A.M., 1933, College of the Pacific; LL.D., 1944, University of Redlands.

John Pagani (1954)
Professor of Business Administration; Chairman, Department of Accounting; Associate Dean, School of Business
B.S.C., 1932, University of Santa Clara; Ph.D., 1951, Stanford University.

D. Robert Papera (1960)
Associate Professor of Business Administration; Chairman, Department of Finance
A.B., 1949, A.M., 1951, Ph.D., 1958, Stanford University.

Frank Pettipher (1960)
Associate Professor of Business Administration
B.Sc., 1925, D.Sc., 1927, Birmingham University (England).

E. Grosvenor Plowman (1962)
Professorial Lecturer in Management
Ph.D., 1930, University of Chicago.

James W. Robertson (1963)
Assistant Professor of Business Administration
B.S., 1959, University of Colorado; M.B.A., 1960, University of Denver; D.B.A., 1963, University of Washington.

G. Lee Sandritter (1963)
Professorial Lecturer in Management
M.D., 1935, University of Nebraska.

Randolph F. C. Shen (1962)
Assistant Professor of Business Administration
A.B., 1945; National Wu-Han University (China); A.M., 1951, University of California at Los Angeles; Ph.D., 1964, University of Illinois.

Edwin Timbers (1961)
Associate Professor of Business Administration
A.B., 1944, West Virginia University; A.M., 1951, Ph.D., 1954, University of Michigan.

Joseph M. Trickett (1958)
Professor of Administration; Chairman, Department of Management
Ph.B., 1936, Washburn University; M.B.A., 1938, Stanford University; Ph.D., 1953.

Zbynek L. Vancura (1962)
Assistant Professor of Business Administration
A.B., 1951, Netherlands School of Economics; Drs. (Econ.) 1954.

Thaddeus J. Whalen, Jr. (1962)
Assistant Professor of Business Administration
B.S., 1958, University of Santa Clara; A.M., 1962, Ph.D., 1964, University of California.

IV

THE UNIVERSITY OF SANTA CLARA

SCHOOL OF ENGINEERING

CATALOG · 1964-1965

SANTA CLARA · CALIFORNIA · 95053

SECTION IV

SCHOOL OF ENGINEERING

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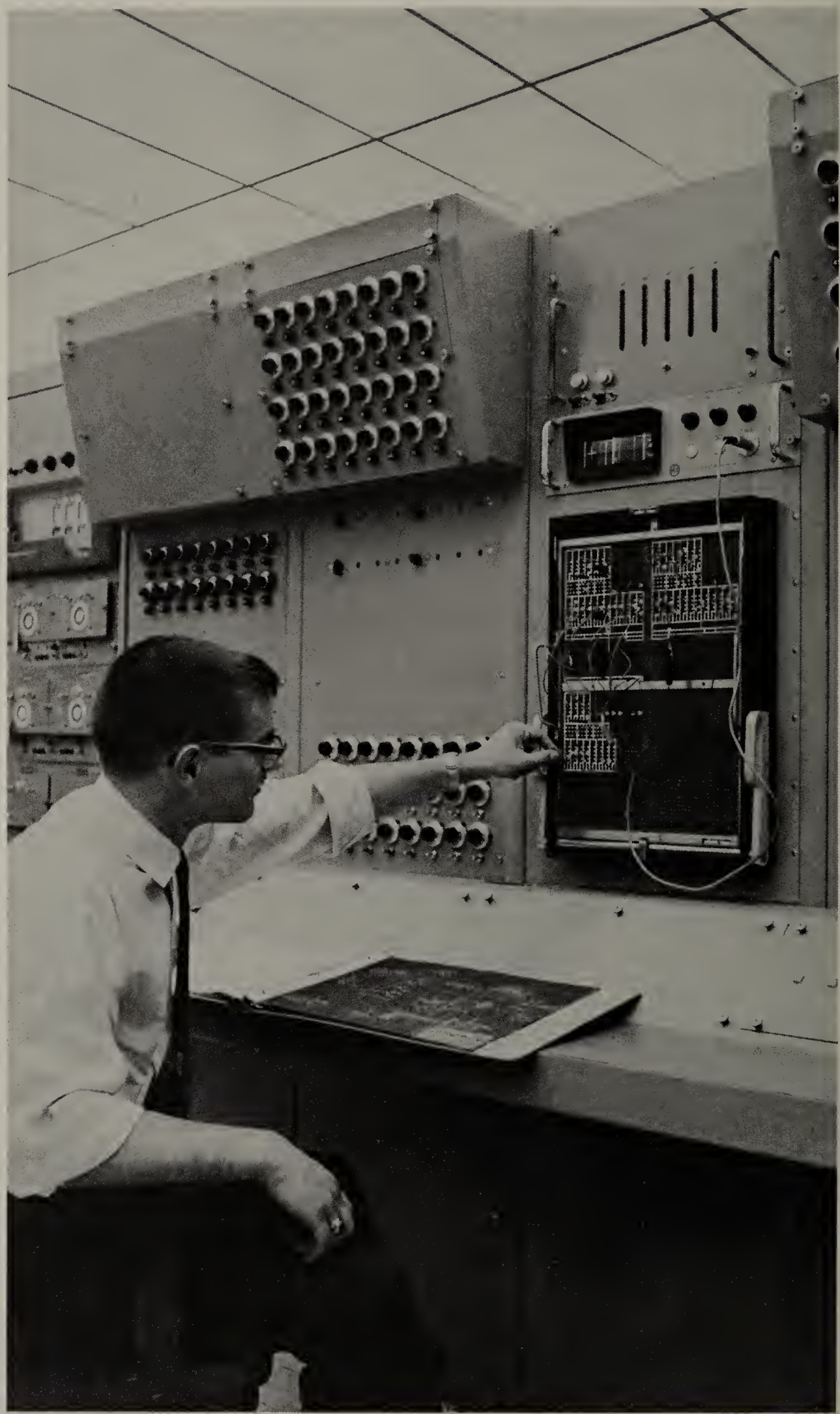


SCHOOL OF ENGINEERING

ADMINISTRATIVE OFFICERS

PATRICK A. DONOHOE, S.J., PH.D . . . . . President
ALEXIS I. MEI, S.J., PH.D. . . . . Academic Vice-President
ROBERT J. PARDEN, PH.D. . . . . Dean of Engineering

AIMS

". . .it is a Catholic school, yet those of other faiths are admitted also, and their religious opinions are not interfered with. . .to cultivate the heart. . .a care of morals, no less than intellectual improvement, are duties kept sacredly in view. . . ." John Nobili, S.J., first President of the University of Santa Clara.

To these goals of fundamental knowledge – an inquiring mind, good habits of self-discipline, aptly expressed by Santa Clara's first president – the professional school adds the requirement of preparation to make a specific social contribution. Engineering knowledge was once passed from generation to generation in the familiar pattern of the apprenticeship. With the increasingly complex applications of science which provided the groundwork for the Industrial Revolution, those who were charged with applying science to the needs of the society in which they live – engineers – turned to the universities for increased formal preparation in science and mathematics. To accelerate the rate at which knowledge of contemporary engineering applications could be learned above that of the apprenticeship, schools of engineering developed – extending the curriculum beyond science and mathematics to include the methodology of engineering applications. Not only were the traditional goals of the University embraced, but to them were added specific professional needs – needs not only of the individual, but of the profession he represents.

The function of engineering is to bridge science and society; to modify nature to meet the needs of society within the restrictions dictated by social, political, and economic considerations.

In order to act as the bridge between science and society, the engineer must be both knowledgeable in science and sensitive to the means which can be used to satisfy social needs.

The rapid expansion of knowledge and complexity in all areas of science and engineering demands an increasing amount of course work, to broaden educational goals as well as to provide increased depth in the graduate's area of specialization. Since this ideal is not attainable in the traditional four-year pattern, each institution must select the curriculum it feels best meets the needs of its own students.

Because of the wide variety of engineering opportunities, and because so many graduates determine to go on for further study, the

School of Engineering undergraduate curriculum minimizes specialization and combines it with general study in the humanities and the social and natural sciences.

Students who desire an even more liberalized approach to engineering education may elect the Bachelor of Science in Engineering degree program which permits additional courses in the life sciences, business administration, or the social sciences.

One-third of those students who earn Engineering degrees undertake graduate work in engineering. An additional group pursues graduate work in law, medicine, business administration, city and regional planning, and other areas where an undergraduate preparation combining science, applied science, and the liberal arts is desired.

The engineering activity requires all types of people with different interests, preparations, and abilities. Regardless of the field of engineering, there is a pattern of assignments describing the kinds of jobs in which engineers engage. These include:

Technical Management in which the engineer directs a team of engineers—technicians, mechanics, and other skilled artisans.

Consulting in which the engineer alone, or as part of a firm, offers his services to a client needing professional counsel.

Design in which the engineer plans structures or systems, using his knowledge of scientific principles and the properties of materials.

Research and Development in which the engineer seeks additional knowledge about basic, physical phenomena and develops this knowledge into a product or service which aids society. In this assignment the engineer works closely with the scientist, and often their division of labor is difficult to identify.

Construction and Production in which the engineer translates the design engineer's drawings and specifications into structures, machines, or systems.

Teaching in engineering schools and colleges.

These are general assignments. Engineers also undertake assignments which require engineering background and experience, such as administration, management, and sales.

ALLIED OCCUPATIONS

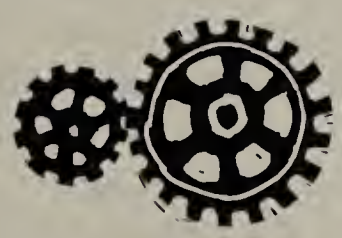
To be able to narrow one's interest in a career to a specific program, such as Engineering, it is necessary to recognize other kinds of assignments whose preparation follows different formal avenues from that of Engineering. For example:

The Scientist is interested in basic relationship and has an intense curiosity about nature. His discoveries are the raw material for the engineers' applications. A career in science normally is associated with the work of the physicist, the chemist, the biologist, and other assignments in basic science. The preparation for these careers differs from that of the engineer.

The Mathematician is concerned primarily with mathematics as precise description and with a construction of mathematical models of physical situations. His contribution to engineering is interpretation, prediction, and application of generalized expressions to specific situations. Here again the work of the mathematician and the engineer overlap considerably. Many kinds of engineering assignments require a considerable sophistication in mathematics. It is in the concern for applications that the attitude of the engineer and the mathematician differ. The mathematician may often be more interested in mathematics as a science than he is in applications which might utilize mathematics.

The Technician is one of the men who work with engineers. His interest is practical and generally he does not need the same amount or kind of formal education. Primarily his job is to gather data and assemble accumulated experience for application to specific and, sometimes, repetitive problems.

The Mechanician or Craftsman is concerned with shaping or forming raw materials into useful forms. He fabricates parts, assembles machines, often installs, tests, and maintains equipment. His preparation normally involves the development of a high degree of manual skill.



A career in engineering provides a fascinating life for those who are interested in and have the ability to perform the engineering function. It is the purpose of the University to provide the environment in which the intellectual abilities to pursue this career successfully can be enhanced.

ENGINEERING AT SANTA CLARA

The undergraduate programs leading to the Bachelor of Science in Civil, Electrical, and Mechanical Engineering were first offered at the University of Santa Clara in 1910. They were accredited by The Engineers Council for Professional Development in 1937. Since that time, the Bachelor of Science in Engineering, the Master of Science in Civil, Electrical, and Mechanical Engineering, in Engineering Mechanics, in Applied Mathematics, the Master of Science in Engineering, and the Doctor of Philosophy in Electrical Engineering programs have been added.

FACILITIES FOR ENGINEERING

The School of Engineering's laboratories are contained in three buildings in the Sullivan Engineering Center. The three units completed in 1960 and a projected lecture, seminar, and office building will house the entire School of Engineering.

Civil Engineering Laboratories

The Mechanics of Materials Laboratory contains testing machines of both the hydraulic and mechanical type available in loading ranges from 8,000 to 120,000 pounds. Hardness, fatigue, impact, torsion, and beam-testing machines to a wide range of capacities are used for instruction and research. A wide selection of electric strain-gaging apparatus is available for static, dynamic, and repeated loads. These include regular and recording oscilloscopes, low-frequency strain recorders, and static strain indicators.

The Soil Mechanics Laboratory is equipped with the most recently developed apparatus for physical testing of soils. The laboratory contains consolidation devices and triaxial compression testing units equipped for controlled stress, controlled strain, or cyclic loading, and equipment for sample preparation, permeability tests, laboratory compaction of soils, and determination of water content, specific gravity, and consistency limits.

Electrical Engineering Laboratories

Laboratories and facilities are available for research and instruction in electrical machinery, electric controls and servomechanisms, computing, electrical measurements, electronics, and communications. Electrical power over wide ranges of frequency and voltage is available in every laboratory.

The Computing Laboratory contains a general purpose 70-amplifier analog computer, recording and other accessory equipment. The analog computer provides the necessary facilities for the analysis of a wide variety of dynamical problems. The development of new computing devices and techniques is a part of this laboratory's activity. Experimental procedures are developed in laboratory sessions.

In addition to this analog computer facility which is located within the Department, a general purpose digital computer is located nearby. Computing time is available for regularly scheduled instructional classes and for the research activities of graduate students and the Engineering faculty.

The Electronics and Communications Laboratories provide modern facilities in electronics, wire communications, radio communication, and microwaves. These laboratories are equipped with signal generators, oscillators, precision bridges, cathode-ray oscilloscopes, Q-meters, a wave analyzer, an artificial transmission line, and other precision measuring equipment. A shielded radio room for interference-free radio measurements is also available.

The Control Systems Laboratory is well equipped with modern instruments for experimental studies of individual control-system components and of complete systems. In addition to the usual electronic test equipment, there is equipment for construction and test of many types of servos, modern oscillographic recorders, and numerous analog and digital components. From time to time additional special-purpose test equipment is constructed to facilitate studies of adaptive control systems, digital control systems, and carrier control systems, among others. This equipment is frequently supplemented by the use of analog and digital computers located in adjacent laboratories.

An anechoic chamber which simulates free space allows study of high-frequency wave properties. Research related to antenna design is currently being conducted.

The interdisciplinary program in bioengineering utilizes facilities in Engineering, Biology, and Chemistry on campus; the medical research facilities of an adjacent hospital are appropriate for certain research interests.

Mechanical Engineering Laboratories

The Mechanical Engineering Laboratories include bench laboratories and a high-bay facility for experimentation in free-fall systems, fluid mechanics, thermodynamics, heat and mass transfer, propulsion, combustion, power generation, and air conditioning.

A variety of internal combustion engines installed on dynamometer stands can be used for studies in diesel and spark-ignited engine per-

formance. An axial-flow fan with adjustable blades attached to a wind tunnel permits a variety of experiments to be performed in aerodynamics and turbomachinery. A flame tube with photoelectric sensors is available for combustion studies. A shock tube with a 3″ by 3″ section is used to study shock-wave phenomena.

The fluid dynamics area contains equipment to illustrate the principles of fluid flow and to familiarize the student with basic elements of hydraulic machinery and their associated instrumentation. Each device may be supplied directly from a pump or from a constant level standpipe with a 35-foot head.

Included in the Mechanical Engineering Laboratories is the equipment associated with electro-mechanical energy conversion. A variety of direct- and alternating-current machines, transformers, and associated equipment is available.

A unique approach is made in utilization of a complete metal-processing facility. The first course in this area is taught by an engineer in order that the students become familiar with machine tool processes from an engineering design point of view. The student further utilizes the shop facility during his thesis activities. The facility is also utilized for construction and maintenance of experimental apparatus.

The Computer and Data Processing Center

The Computer and Data Processing Center of the University is located in the Sullivan Engineering Center. An IBM 1620 digital computer and associated card equipment is used for teaching and research by faculty members and students. Introduction to computer programming is part of the freshman design course. Several undergraduate courses require the use of this facility as part of their regular laboratory. Other computer facilities are available in the Electrical Engineering Laboratories.

THE UNDERGRADUATE PROGRAM

The undergraduate degree programs in Civil, Electrical, and Mechanical Engineering and the Bachelor of Science in Engineering program are planned around a common core of courses which will provide:

1. A thorough preparation in the basic sciences of physics, chemistry, and mathematics.

2. The general application of these sciences as developed in the

engineering fundamentals: mechanics of solids and fluids, properties of materials, thermodynamics, electricity, and magnetism.

3. Assistance in further developing the ability to communicate orally, and by written and pictorial presentations.

4. Study in the humanities, the social sciences, theology, and philosophy.

The professional subjects pertaining to the analysis, synthesis, and design sequences in Civil, Electrical, and Mechanical Engineering are developed primarily in the upper division. A combination of these or other subjects may be developed for other degree objectives.

Admission as a Freshman

Applications for the freshman class in Engineering are accepted from both men and women students. The class is selected from the applicants on the basis of (a) achievement in high-school subjects with special reference to mathematics and science, (b) results of the College Entrance Examination Board tests, (c) recommendations, and a personal interview when this is feasible. Specific instructions for undergraduate applications are described elsewhere in this publication and on the application form which may be obtained from the Office of the Registrar. Applications to take the Entrance Examinations must be made directly to the College Board. The specific requirement in each of these categories is described below.

Applicants must be graduates of an accredited high school and must present no less than sixteen units including the following:

English	3	Trigonometry	½
Foreign Language (one language)	2	History	1
Algebra	2	Chemistry	1
Geometry	1	Physics	1
		Unprescribed	4½

It is strongly recommended that the unprescribed units be in mathematics, languages, natural or social sciences. Applicants who offer a list of subjects not in accordance with the above will be admitted at the discretion of the Admissions Committee, based on their College Entrance Examination achievement and their high-school record.

Entrance Examinations

All applications for admission to the freshman class in Engineering are required to take the following examinations:

1. The Scholastic Aptitude Test.
2. Achievement Tests in advanced mathematics, and any two of the following: English, physics, or chemistry.

The Entrance Examinations are given by the College Entrance Examination Board and are offered at many locations throughout the world. Students living in the West should write to Educational Testing Service, 1947 Center Street, Berkeley, California, requesting the application form and information on examination dates and locations. Students living in the East should write Educational Testing Service, P. O. Box 592, Princeton, New Jersey.

Examinations may be taken on the same or different days, but all tests should be completed by January of the senior year in high school. The Board should be requested at the time the tests are taken to send the scores to the University of Santa Clara.

It is recommended that a test application form and test information be obtained from the College Entrance Examination Board not later than October of the senior year in high school.

Admission as a Departmental Scholar

The University of Santa Clara's Departmental Scholars Program provides the opportunity to recognize outstanding students majoring in each department. Freshmen entering with a high-school grade point of at least 3.5 and Scholastic Aptitude Test scores exceeding 1350 may apply for an interview with the Dean of the School of Engineering for admission to the program at entrance. The high schools from which accepted students enter will be notified of this designation.

Students who are not designated Scholars at entrance may apply for admission to the Departmental Scholars Program if they maintain a B average in their program.

Sixth-Semester Admission

Students who have earned a 3.5 out of 4.0 average in the first three years of high school may seek admission to the School after their sixth semester. Their application should be clearly identified and include transcripts and three letters of recommendation. The decision concerning admission will be rendered immediately. It is requested that College Board scores be submitted in the normal manner for use in statistical studies. Students admitted after six semesters will not have to make the normal admission deposit until March preceding September enrollment.

Advanced Placement and Advanced Standing Credit

The University is a participant in the advanced placement program of the College Entrance Examination Board. Students desiring consideration for such placement should take the College Board Advanced Placement Examinations given in May of each year. On receipt of the scores of these examinations, and other evidence presented in this procedure, action will be taken and notification will be sent to the applicant, usually in August preceding the enrollment.

Placement Examinations

During the first three days after freshman students arrive on campus, placement examinations will be administered in English and mathematics for engineering students. Lower-division entrants must take the examination in Subject A to test ability to write English correctly. Those who fail this examination are required to pass the course in Subject A without unit credit toward graduation. A fee is charged for this course. Those who score exceptionally well in this examination will pass the initial freshman English course and move on to a more advanced presentation. It is recognized that mathematics is a cumulative subject. The mathematics placement examination will test the student's ability in algebra and trigonometry, and those students judged sufficiently deficient to endanger their ability to do the calculus will be required to take a quarter of remedial algebra and trigonometry.

Admission as a Junior

Admission to advanced standing is by specific action of the Committee on Academic Standing, which will evaluate all credits presented and determine the rating of the candidate. Only students in good standing at the last college attended will be considered. No student on academic or disciplinary probation, or suspension, will be considered for admission.

The category of "Special Student" is reserved for those persons of mature age whose experience and test results reflect the ability to do college work. Students from other than English-speaking countries must present a score in the English achievement test of the College Entrance Examination Board. Immigration Form I-20 will be issued to those students accepted on a full-time basis. Directions for registering will be mailed to each applicant with his letter of acceptance.

The student normally will be able to complete a Bachelor's degree program in six terms if he presents 65 semester hours including the following minimum subject requirements:

	Minimum No. of Units
Analytical Geometry and Calculus	12
Chemistry (for engineering and science students)	7
Physics (for engineering and science students)	10
Graphics, and engineering materials or surveying	6
Freshman English 1A-1B	6
Liberal Electives (English, Economics, History, Social Studies, Languages)	12
Unspecified	12
Total	65

Departmental Scholars Program

The Departmental Scholars Program is available for students of superior initiative and ability. Students who wish to participate in this Program must make application for it, and acceptance will be based on an interview and previous achievement. A minimum of a B average is required, plus the desire to undertake a special program of studies. This is not a program for the purpose of recognizing students of superior academic accomplishment – the Dean's Honor Roll, the scholastic honorary fraternity Tau Beta Pi, and other accolades are reserved for this recognition. Rather, it is the opportunity for a student to undertake the additional challenge of courses and programs of independent study and research. The student may withdraw from the Program with permission at any time he has completed all of his current commitments and resume a regular degree program.

A Departmental Scholar will be allowed to: (a) enroll in Scholars courses in other departments of the University; (b) enroll in department courses in independent study and research: 190 and 199; (c) participate in undergraduate research projects, particularly during the summer months; (d) extend the scope of a thesis project of unusual merit; (e) make course substitutions of particular merit for professional goals.

The Dean's Honor Roll

Each term, a list of those who have achieved an academic rank in the top 10 percent of their class will be published.

The Undergraduate Curriculum

The undergraduate degrees are earned by completion of 42 term courses in which a C average is earned. All students earning a Bachelor of Science degree in Engineering are required to complete the following term courses:

Freshman

Mathematics 11	Mathematics 12	Mathematics 13
Chemistry 3A	Chemistry 3B	Physics 4A
English 1A	English 1B	Liberal Elective
Liberal Elective*	Engineering Design I	Engineering Major

Sophomore

Mathematics 21	Philosophy 4	Liberal Elective
Physics 4B	Physics 4C	Free Elective
Liberal Electives (2)	Liberal Elective	Engineering Major (2)
	Military Science	

Junior

Electrical Engineering I	Strength of Materials	Philosophy 101
Statics and Dynamics	Electrical Engineering II	Engineering Major (2)
Thermo-Fluid Mechanics I	Thermo-Fluid Mechanics II	

Senior

Philosophy 102	Liberal Elective	Engineering Major (3)
Engineering Major (2)	Engineering Major (2)	

The following courses are scheduled by those electing a specific degree program:

Civil Engineering: CE 10, 20, 121, 130, 131, 133, 135, 140, 145.

Electrical Engineering: Physics 40; EE 104, 111, 112, 114, 131, 151, 161, 198.

Mechanical Engineering: Physics 40; ME 11, 15, 110, 122, 135, 140, 198; EE 114.

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*Liberal Electives:
All Catholic students schedule three term courses in Theology.
All students must meet the American Institutions requirement by a noncredit examination, or by scheduling a designated course: Economics 116; History 174A, 174B, 17A, 17B; Political Science 1, 151A, 151B, 151C, 157A, 157B, 162, 172, 181. The remaining courses are elected with the advisor's approval.

The Bachelor of Science in Engineering

In addition to the courses taken by all engineers, the student who seeks a more general program, or one with a specialized need outside of engineering, may follow a program which has been approved by the advisor to whom he is assigned and by the Dean of the School of Engineering. This program must be developed in the junior year. It must include:

1. An engineering design sequence of three term courses selected from the Civil, Electrical, or Mechanical program.
2. Three additional term courses in Mathematics, Science, or Engineering.
3. The balance of the program selected from other courses in the University. These courses might include:
   a) Biology and Chemistry: for those planning graduate work in medicine or related health sciences, sanitary engineering, or hybrid programs, such as bio-engineering.
   b) Statistics, Numerical Analysis, and Accounting: for those interested in data processing and related assignments.
   c) Statistics, Accounting, and Production Management: for those interested in industrial management and graduate work in that area.
   d) Statistics, Accounting, Social Science, History of Architecture: for those interested in city and regional planning and administration.

Normal Time Requirements

The average student will be able to complete a degree program in 12 terms. Those students who must assume part-time off-campus jobs, or who add additional programs to the Engineering program, will require additional terms. The curricula in Engineering require 42 courses for graduation and a cumulative 2.0 average.

Unless excused for reasons of health or prior military service, all freshman and sophomore students are required to enroll in the Basic Course of the Reserve Officers Training Corps. Students following an Engineering program of study who are also enrolled in the junior and senior year Advanced Course will usually require more than the normal four years in the University to obtain a baccalaureate degree.

Senior Thesis

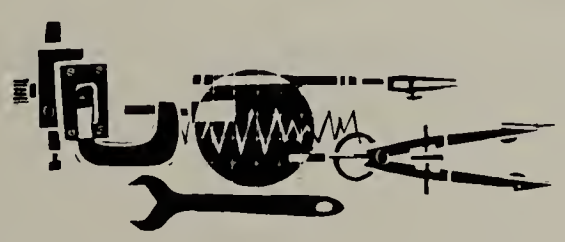
All students seeking a degree in Engineering are required to submit a thesis during their senior year.

The senior thesis provides a student with the opportunity to carry out an original investigation in an orderly fashion, the momentum of progress being supplied primarily by the student's enthusiasm, interest, and effort. The project is scheduled throughout the senior year and must be submitted before the student is admitted to his final examinations.

It is felt that a good undergraduate thesis:

1. Should involve an element of originality. It should be an investigation on the frontier of the student's knowledge.
2. Should require an element of design, an element of equipment assembly and utilization of instrumentation and a test program.
3. Should include successful evaluation of results utilizing sound test techniques and application of fundamentals of engineering. It is desirable that the evaluation require an extension of previous information to cope with the thesis project.

The Department chairman appoints a thesis advisor. The advisor will approve the thesis subject and method of approach, the outline of the thesis, initial drafts and final copy of the thesis as the project develops.



THE GRADUATE PROGRAM

The School of Engineering offers graduate work leading to the Master of Science degree in Civil, Electrical, and Mechanical Engineering, Engineering Mechanics, Applied Mathematics, and the Master of Science in Engineering. The Doctor of Philosophy may be earned in Electrical Engineering.

Because of its geographical location in the heart of one of the nation's largest concentrations of electronic and aerospace industries, the University of Santa Clara pioneered a unique graduate program structure. Many graduate courses are offered between 7 and 9 o'clock in the morning to be of maximum convenience to engineers continuing their formal education while working at their professional careers. Students must be admitted to graduate standing in the School in order to participate in this program.

While most graduate students have undergraduate preparation in an engineering curriculum, it is feasible to enter from chemistry, physics, or mathematics. The amount of undergraduate work which must be undertaken before the degree program is dependent upon the specific preparation and the degree sought.

Master of Science Program

Admission to Graduate Standing

Application for admission to graduate work should be made to the Dean of the School of Engineering on the form available from that office. Official transcripts of record covering all college and university work completed to date, together with official evidence of degrees conferred, must be received prior to admission as a graduate student. Two separate original and official records must be presented from each institution previously attended.

Students will be admitted to Degree candidacy at initial enrollment at Santa Clara if they:

1. Received their Bachelor's degree in Engineering from an ECPD accredited four-year program substantially equivalent to that of Santa Clara, and who plan to undertake a graduate program in the same field.
2. Accomplished a scholastic average of at least 2.75 (based on a 4.0 maximum) in the technical work of the last two undergraduate years.
3. Submit their application and supporting credentials at least six weeks before registration for the semester of initial enrollment.
4. Develop a program of studies with their assigned advisor before registration and file it with the Dean of Engineering.

Students who have earned a Bachelor's degree in a four-year engineering, science, or mathematics program substantially equivalent to that of Santa Clara with a 2.5 out of 4.0 grade-point average but who do not initially meet the Degree Candidate requirements, will be allowed to enroll for graduate work at the discretion of the Graduate Admissions Committee. The School reserves the right to deny admission if the previous program has not been of such character as to furnish an adequate foundation for advanced academic study. In order to insure processing of applications, they must be received, together with transcripts of previous work, at least four weeks before registration for the initial enrollment. Material received later may prevent or delay registration and subject the student to the late registration fee.

When the unclassified graduate student has completed 15 quarter-hours of work at Santa Clara, and if he has eliminated all assessed undergraduate deficiencies, he may apply for Degree Candidate classification. Since a 3.0 grade-point average is required to receive the Master's degree, the application will not be approved if the applicant's scholarship accomplishment is below 3.0 in all courses taken at Santa Clara. Upon becoming a Degree Candidate, students will be assigned a major field advisor and should arrange a conference with him to develop a Program of Studies.

Program of Studies

A Program of Studies must be developed with the approval of the major department and filed with the Dean of Engineering. It is a plan of study which, when satisfactorily completed, will merit the receipt of the appropriate degree. It should be filed during the first term enrollment of each student who receives graduate status. If changes are approved by the Department Chairman, they should be recorded so as to correct the original program.

Master's Thesis Requirement

All students are required to complete a research project and report it in a Master's Thesis unless specifically exempt by the Department. Exemption will normally be granted only to those who complete their program on a part-time basis and do not enroll in more than 10 quarter-hours in any one quarter. Up to 9 quarter-hours of credit may be earned for the Master's Thesis.

Master's Degree Requirements

The Master's degree will be granted to degree candidates who complete a program of studies which has been approved by the major department. It must include no less than 45 quarter-hours of which 9 may be earned by completing a thesis. In addition, a quality level of 3.0 (a B average) must be earned in course work taken at Santa Clara. Resident requirements of the University will be met by completing 36 quarter-hours of the graduate program at Santa Clara. All units applied toward the degree, including those transferred from other institutions, must be within a six-year period.

All degree candidates must file a degree application with the Dean of the School of Engineering at least two months before the day on which the degree is to be granted. A degree application form may be obtained from the same office.

Department Requirements

Civil Engineering and Engineering Mechanics

The program in Civil Engineering emphasizes the field of structural engineering; consequently, the degree may be taken in Civil Engineering or Engineering Mechanics. The following courses must be taken by every candidate for the Master's degree. Adjustment of this requirement may be made in special cases.

A. Math 130 Advanced Engineering Mathematics I.
CE 150 Advanced Strength of Materials.
CE 154 Theory of Statically Indeterminate Structures.
CE 157 Theory of Plates.
CE 158 Theory of Shells.
CE 165 Dynamics of Structures.
CE 168 Advanced Theory of Structures.

Electrical Engineering

The following courses must be taken in order to be eligible for the Master's degree in Electrical Engineering. Adjustments of this requirement may be made in special cases.

Three Advanced Mathematics Courses including A. Math. 135
Two Advanced Physics Courses
One Graduate Course in Electromagnetic Fields – EE 201
One Graduate Course in Modern Network Analysis or Synthesis
One Graduate Course in Control Systems
One Graduate Course in Electronic Circuits

Eighteen units of electives, selected with the approval of the Department, will allow concentration in the following areas of study: networks, controls, computers, electronic circuits, or field theory and applications.

Mechanical Engineering

A program of studies to meet the interest of the individual should be developed with a member of the Department. Candidates for the Master's degree must submit their proposed program for departmental approval upon filing for candidacy status.

Master of Science in Engineering

This program was initiated to accommodate those who wish to seek goals which do not fall within the patterns of the designated degree programs. A program which combines engineering, mathematics, the physical and life sciences might be a desired plan. The program must be made up of courses in engineering, mathematics, and science; approved by an advisor; and filed at the time degree candidacy is sought.

Master of Science in Applied Mathematics

The Applied Mathematics program is open to those students who have earned a B.S. degree in Engineering, Science, or Mathematics. A minimum of 36 quarter-hours of mathematics beyond the calculus which are normally included in an undergraduate applied mathematics degree program must have been completed. These courses, which do not apply toward the Master of Science in Applied Mathematics degree would normally include: (course numbers are Santa Clara equivalents)

Ordinary Differential Equations (A. Math 101, 102)
Complex Variables (A. Math 135, 136)
Advanced Calculus (A. Math 104, 105, 106)
Modern Algebra, Linear Algebra or
Matrix Theory (A. Math 140, 145)
Applied Mathematics (A. Math 130, 131, 132)

Other 100-level Mathematics courses

The courses scheduled for the Master's degree should include no less than 30 quarter-units in Applied Mathematics of which 8 quarter-units must be in the 200 level. The balance of the degree program may be in Engineering or Physics.

The Doctor of Philosophy Program

The degree of Doctor of Philosophy is conferred by the School of Engineering primarily in recognition of competence in the subject field and the ability to investigate engineering problems independently. The work for the degree consists of engineering research and the preparation of a thesis describing it; and a program of advanced studies in engineering, mathematics, and related physical sciences. The student's work is directed by the Department, subject to the general supervision of the Engineering School.

Requirements for Admission to the Doctoral Program

All applicants for the doctoral program are required to take the advanced Engineering Test of the Graduate Record Examination administered by the Educational Testing Service, 4640 Hollywood Boulevard, Los Angeles 27, California, or 20 Nassau Street, Princeton, New Jersey. The Testing Service must be requested to forward the results to the Dean, School of Engineering. An academic achievement of the Master's level, or its equivalent, is required of all applicants. Students who have earned the Master's degree from the University of Santa Clara must file a new application to continue work toward the Doctor's degree.

All applicants for doctoral degree programs who have been admitted by the Engineering School to advanced standing shall present themselves for preliminary examinations by their major department at such times as shall be set by the departments. These examinations shall be written and/or oral and shall include fundamentals of mathematics and the physical sciences as well as engineering subjects.

Only those applicants who have shown sufficient background and promise in the preliminary examinations shall be accepted as doctoral candidates. The preliminary examinations may be repeated only once, and then only after one year.

The applicant should:

1. Submit an Application for Admission to the Engineering School.
2. Submit a list of three references who can attest to the potential of the candidate.
3. Submit a 500-word biography indicating the applicant's academic, research, and professional goals.
4. Submit, *if requested,* copies of theses, papers, or reports written by the applicant.
5. Submit copies of transcripts of academic records at all universities attended. Please request the Registrar of each university to forward the transcript directly to the Dean, School of Engineering.

Registration

Students are required to file a program of studies with the Department during the first semester of attendance. This program must be approved by the Graduate Programs Committee. The student's advisor must approve the portion of the program to be undertaken each quarter, whether it is research, course work, or independent reading. An amended program must be filed to record any changes from the original program. Changes must be approved by the Graduate Programs Committee.

A student will not receive credit for a course unless properly registered. Units assigned for research shall be determined by the instructor. The instructor may reduce the number of research units for any term in which the anticipated research progress is not attained.

General Requirements for the Doctor's Degree

The Doctor's degree is granted primarily on the basis of achievement rather than on the accumulation of units of credit. However, the candidate is expected to have completed three academic years of residence in a graduate program beyond the Bachelor's degree. Generally this is interpreted to mean a minimum of 135 quarter-units of graduate

credit. Of these, a total of 45 may be earned as research credit for the Master's and Doctor's theses. Normally the remainder is earned through course work and independent study.

Residence: A minimum of eleven-months full-time study must be undertaken at the University for the doctorate. The residency time shall normally correspond to the period of the oral examinations and the completion of the dissertation. This may be accomplished in one calendar year or four full-time summer terms.

Admission to Candidacy: Upon completion of the formal course program of studies, as approved by the Graduate Programs Committee, the student shall present himself for comprehensive examinations on the subjects of his course work. The arrangements for the comprehensive examinations shall be initiated by the student through the Graduate Programs Committee.

Those students who have performed satisfactorily on the comprehensive examinations may apply for degree candidacy by submitting a formal letter of application to the Dean of the School of Engineering. This must be accompanied by a statement of intent of research supervision by the student's thesis advisor and a letter of recommendation by the Department Chairman. It shall be the student's responsibility to arrange for a thesis advisor.

The comprehensive examinations normally must be completed within five years from the time which the student has been admitted to advanced standing. Comprehensive examinations may be repeated only once.

Preparation for Research: The Doctoral candidate shall request his thesis advisor and the Department Chairman to form a Doctoral Committee. This committee shall consist of at least five members, including the thesis advisor and two additional members from the major department. The committee shall include two members from the Mathematics and/or Physical Science departments.

The Doctoral Committee shall determine language requirements, and any further studies which may be required.

Oral Examination: Within a period of three years after admission to candidacy, the student must normally make arrangements with the Doctoral Committee for the oral examination on his research and thesis. This examination shall be conducted by the Doctoral Committee and whomever they appoint as examiners. The thesis must be made available to all examiners one month prior to the examination. The oral examination shall consist of a presentation of the thesis, which shall not exceed forty minutes, and the defense of the thesis, which shall not exceed one hour. This examination shall be open to all faculty members of the University of Santa Clara and shall be announced two weeks prior to the examination date.

Thesis: At least one month before the degree is to be conferred, the candidate must submit to the Dean of the School of Engineering two copies, ribbon or reproduced, of the thesis describing his research in its entirety. The thesis shall not be considered as accepted until it has been approved by the Doctoral Committee, and until one or more articles based upon it have been accepted for publication by an acceptable professional or scientific journal.

The requirements for the Doctor's degree by the School of Engineering have been made to establish the structure in which the degree may be earned. Upon written approval of the Academic Vice-President, the Dean of the School of Engineering, and the Chairman of the Department, other degree requirements may be established. The Faculty of the University reserves the right to evaluate both the undertakings and the accomplishments of the degree candidate in total and award or withhold the degree as a result of its deliberations.

Information for the Guidance of all Graduate Students

Standards of Scholarship

Only courses in which the student has assigned grades of A, B, or C may be counted in satisfaction of the requirements for the Master's degree. The student must earn a 3.0 average in all courses taken at Santa Clara as a graduate student to be eligible for the degree. Only credit, and not grade-points, are transferred from other institutions. The Dean of Engineering will request students to terminate enrollment when satisfactory progress towards a degree is not being maintained.

Readmission

An application for readmission is required of persons whose enrollment in the University lapses for two consecutive terms, not including summer terms. A regular admission form will be used with the readmission status marked on it. Applicants for readmission must submit transcripts of the latest graduate work completed in other departments of the University together with official transcripts of study completed elsewhere since the previous enrollment.

Academic Loads

It is recommended that work-study students limit their course load upon their initial registration to a maximum of 4 quarter-hours. Despite the convenience of the hours of class meeting, the additional time for study, plus other responsibilities, may lead to an underestimation of the quality of work that can be maintained under these conditions. Students

enrolled under a work-study plan may not enroll for more than 6 quarter-hours. Students enrolling in more than 6 quarter-hours will be considered resident students and subject to the appropriate regulations.

Resident students with a research or teaching assistantship will not be allowed to enroll in more than 12 quarter-hours in any quarter, and no graduate student may exceed 15 quarter-hours in any one quarter. Ten quarter-hours is considered the minimum load for full-time enrollment.

Graduate Assistantships, Loans

Both fellowships and teaching or research assistantships are available to qualified graduate students. Fellowships include the National Science Foundation Graduate Traineeships in Engineering, the NSF Cooperative Graduate Fellowships, and The Summer Fellowship Program for Graduate Teaching Assistants. Grants are up to $2,400 for the nine-month academic year plus tuition and a dependents allowance.

Stipends for teaching or research assistantships vary, depending on qualifications and on the work assignment. One-quarter time appointments (10 hours a week assigned duties) and one-half time appointments (20 hours a week assigned duties) are available.

All applications for fellowships or assistantships must be submitted before March 15 preceding September enrollment. Notification will be given by April 15. Other closing dates may apply to specific programs. These will be indicated on supporting information sheets. Further information and application forms may be obtained upon request from the Office of the Dean of Engineering.

The University offers National Defense Act loans open to undergraduate and graduate students in need of financial assistance. Information regarding these loans may be obtained from the Director of Financial Aids, University of Santa Clara.

Courses Completed at Other Institutions

A maximum of 9 quarter-hours of credit may be transferred from other institutions at the discretion of the Graduate Committee. Eligible courses include those taken as a graduate student in which a grade of B or better was earned.

Auditors

Students will be allowed to audit courses with the permission of the instructor in charge of the course and the Dean of the School. Tuition will be charged in the same manner as though it were registration for credit.

Foreign Students

Admission to graduate study is based on records of undergraduate work. If this study was in a language other than English, the individual's ability to undertake a program where the instruction is in English is difficult to determine. The University will strongly encourage review courses in English and appropriate undergraduate courses, not for graduate credit, when it feels that an individual's progress is suffering because of a language difficulty.

A foreign student who is accepted for enrollment in the University of Santa Clara will receive a certificate of acceptance, which he must show to the consular officer of the United States to whom he applies for a student visa. Foreign students must maintain an enrollment level of at least 10 quarter-hours each term.

Graduate Student Housing

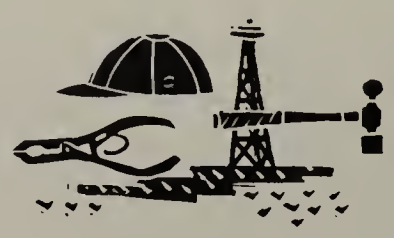
The University does not maintain dormitories for graduate students. Apartments and rooms are available adjacent to the campus in the City of Santa Clara. Meals may be taken in the Student Commons.

Tuition and Fees

An application fee of $5 is charged for the first enrollment in courses in the graduate program. This is paid only once. A tuition fee of $30 per quarter-hour will be charged for all courses, including Thesis. Auditors will be charged the same fees. For comprehensive written examinations, a fee of $10 will be charged for each examination. Graduation and Thesis binding fees will be assessed at the time application is made for the degree.

Refund of Tuition

Any student formally withdrawing prior to the fourth meeting of any regularly scheduled class will receive a refund of one-half of the tuition for that class. No refunds will be made subsequent to the fourth meeting. The date on which written notice of withdrawal is received by the Dean of Engineering will determine the refund, not the date of last attendance by the student.



COURSE DESCRIPTIONS

The undergraduate school is on a term course basis, and the Bachelor's degree requirements are stated in term courses. Credit for graduate courses are stated in quarter-hours and are shown in parentheses following each course title. A term course in the lower division (four at the same time) is equivalent to four quarter-units. A term course taken in the upper division—the junior and senior years (three courses at a time)—is equivalent to five quarter-units. The Bachelor degree requirement of 42 term courses is therefore equivalent to 186 quarter-hours or 124 semester hours if conversion to other systems is desired.

APPLIED MATHEMATICS (AM)

GERALD MARKLE, PH.D., *Coordinator*

The Applied Mathematics faculty is composed of faculty from departments in the University including Mathematics, Engineering, Chemistry, and Physics. Certain of the courses listed below are also taught in the Department of Mathematics degree programs. They are included in the following list of Applied Mathematics because they will be made available to graduate students in the Early Morning Graduate Engineering Program.

101. DIFFERENTIAL EQUATIONS I (2) Not for Graduate Credit

Differential equations in general, first order and simple higher order ordinary differential equations, applications of first order and higher order differential equations.

102. DIFFERENTIAL EQUATIONS II (2) Not for Graduate Credit

Linear differential equations with constant coefficients, applications, systems of differential equations and their applications, linear equations with variable coefficients, existence and uniqueness of solutions to n-th order equations and systems of equations. Prerequisite: AM 101.

104. ADVANCED CALCULUS I (2)

The real number system, continuous functions, extension of law of the mean, functions of several variables, elements of partial differentiation.

105. ADVANCED CALCULUS II (2)

General theorems of partial differential equations, implicit function theorems, transformations and mappings, double and triple integrals.

106. ADVANCED CALCULUS III (2)

Line and surface integrals, theory of integration, infinite series, uniform convergence and power series.

110. INTRODUCTION TO PROBABILITY I (2)

Axioms and basic laws; independence and dependence; random variables and probability laws; the binomial, normal, and Poisson laws.

111. INTRODUCTION TO PROBABILITY II (2)

Mathematical expectation, distribution, deviation and tests of significance. Analysis of variance. Prerequisite: AM 110.

114. ENGINEERING STATISTICS I (2)

Frequency distributions, sampling, sampling distributions, univariate and bivariate normal distributions.

115. ENGINEERING STATISTICS II (2)

Analysis of variance, two- and three-factor analysis; regression and correlation; design of experiments. Prerequisite: AM 114.

118. NUMERICAL AND OPERATIONAL METHODS

Introduction to numerical solutions of algebraic and transdental equations, finite differentials, interpellation, numerical differentiation and integration, solutions of ordinary differential equations. Fundamentals of Fourier and Laplace integrals and applications of Laplace transforms to equation solutions. Partial fraction expansion and pole-zero analysis. Fortran programming of digital computer and analog computer simulation. Prerequisite: Differential equations.

120. NUMERICAL ANALYSIS I (2)

Solution of algebraic and transcendental equations, finite differerences, interpolation, numerical differentiation and integration, programming of representative problems for the IBM 1620, using Fortran.

121. NUMERICAL ANALYSIS II (2)

Curve fitting – Method of least squares, matrix methods with applications to linear equations, solution of ordinary differential equations, programming of representative problems for the IBM 1620, using Fortran. Prerequisite: AM 120.

125. VECTOR ANALYSIS I (2)

Algebra of vectors, differentiation of vectors, applications in the area of mechanics and electricity.

126. VECTOR ANALYSIS II (2)

Partial differentiation and associated concepts, integration of vectors, applications. Prerequisite: AM 125.

130. APPLIED MATHEMATICS I (2)

Hyperbolic functions, power series solution of differential equations, Legendre polynomials, Bessel functions, elliptic integrals. Prerequisite: Differential Equations.

131. APPLIED MATHEMATICS II (2)

Fourier series, orthogonal functions, Euler's formulas, even and odd functions, half-range series. Laplace transforms, basic transforms, transforms of derivatives and integrals, heaviside operators, periodic functions, unit function. Prerequisite: Differential Equations.

132. APPLIED MATHEMATICS III (2)

Partial differential equations, separation of variables, one-dimensional water- and heat-flow equation, Laplace's equation, solutions involving spherical coordinates, Laplace transforms methods applied to the solution of partial differential equations. Prerequisites: AM 130 and 131.

135. COMPLEX VARIABLES I (2)

Algebra of complex numbers; calculus of complex variables, analytic functions, harmonic functions; integrals.

136. COMPLEX VARIABLES II (2)

Theory of power series; Cauchy residue theorem; applications of the Cauchy residue theorem – evaluation of integrals, argument principle, Rouché elemma, inversion of functional relations. Prerequisite: AM 135.

137. COMPLEX VARIABLES III (2)

Fourier, Laplace, and z-transform theory; conformal mapping and application; Poisson integral; asymptotic evaluation of integrals; analytic continuation. Prerequisite: AM 136.

140. MODERN ALGEBRA I (2)

Introduction to postulational systems; integers as an integral domain; study of rational, real, and complex number fields; polynomial forms and functions.

141. MODERN ALGEBRA II (2)

Introduction to group theory; vectors and vector spaces; algebra of matrices; rings and ideals. Prerequisite: AM 140.

145. INTRODUCTION TO MATRICES (2)

Definitions associated with matrices and vectors; basic matrix operations, the matrix inverse, solution of linear algebraic equations, some elementary matrix functions and their uses.

150. INTRODUCTION TO MATHEMATICAL ANALYSIS I (2)

The real number system; set theory; function theory, real point set topology.

151. INTRODUCTION TO MATHEMATICAL ANALYSIS II (2)

Limits; continuity, differentiation, partial differentiation curves and an introduction to Riemann-Stieltjes integration.

201. THEORY OF FUNCTIONS OF A COMPLEX VARIABLE

Complex integration, calculus of residues, power series, conformal representation applications. Prerequisite: Elementary course in Complex Variables.

202. THEORY OF FUNCTIONS OF A COMPLEX VARIABLE II

Continuation of above. Prerequisite: AM 201.

205. ADVANCED NUMERICAL ANALYSIS I

Numerical solution of partial differential equations, finite difference methods, Monte Carlo techniques, programming of representative problems for the IBM 1620. Prerequisites: Elementary Num. Anal. and Fortran programming experience.

206. ADVANCED NUMERICAL ANALYSIS II

Matrix computations, eigen values of finite matrices, application of matrix methods to the solution of systems of linear equations, programming of representative problems for the IBM 1620. Prerequisite: AM 205.

210. INTEGRAL EQUATIONS

Solution of integral equations by successive substitution, solution of the Fredholm equation, applications of Fredholm theory, Hilbert-Schmidt theory of integral equations with symmetric kernels, applications. Prerequisite: Consent of Instructor.

211. CALCULUS OF VARIATION

Necessary conditions, applications to dynamics, optimal control theory. Prerequisite: Consent of Instructor.

212. OPERATIONAL CALCULUS

Laplace transforms, complex variables, inversion theorems, Stern-Liouville systems, Fourier transforms, applications. Prerequisite: Consent of Instructor.

215. MATRIX THEORY I

Properties and operations, vector spaces and linear transforms, characteristic roots and vectors, inversion of matrices, applications. Prerequisite: AM 145.

216. MATRIX THEORY II

Continuation of I. Prerequisite: AM 215.

CIVIL ENGINEERING (CE)

HENRY V. HAHNE, PH.D. *Chairman*

Civil Engineering relates to works in connection with transportation, such as highways and traffic, railways and canals; to structural works, such as bridges, buildings, dams, piers, and many other structures constructed of wood, steel, or reinforced concrete; to sanitary works and works which have to do with water, such as the collection, purification, and distribution of water for a municipal supply; the collection, treatment and disposal of sewage; the drainage of some lands and the irrigation of others. Civil Engineering also includes subjects from the field of mechanics. Engineering, or applied mechanics, encompasses subject matter fundamental to the analysis and design of engineering systems, including such subjects as dynamics, stress analysis, and mechanical behavior of materials. While the products of these analyses – structures, machines, systems – are more widely known than the methods of analysis, this area continues to serve well the needs of those students who wish to pursue graduate study in mechanics, including many phases of aerospace studies.

UNDERGRADUATE COURSES

10. SURVEYING

Survey instruments – their use, adjustment, and care. Principles of topographic mapping, linear measurements, leveling, traverses, curves, earthwork, boundary and public surveys. Field practice.

15. STATICS

Concept of force and equilibrium. Force systems in plane and

in space. Trusses. Friction. Principle of virtual work and its application.

20. GEOLOGY AND HYDROLOGY

Physical and chemical properties of rock-forming minerals, and rock materials. Ground-water hydrology, stream and shoreline processes. Laboratory.

110. DYNAMICS

Dynamics of a particle and dynamics of rigid bodies. Introduction to theory of vibrations, balancing of machinery, and theory of the gyroscope. Prerequisites: PH 4A and CE 15

111. STATICS AND DYNAMICS

Fundamental principles of statics. Dynamics of a particle and dynamics of rigid bodies. Application to problems in engineering. Prerequisite: PH 4A.

115. MATERIALS ENGINEERING

Origin, manufacture, and processing of materials used in civil engineering. Significant properties of metals, wood, cement, and other engineering materials. Corrosion and its prevention. Fire resistance.

116. STRENGTH OF MATERIALS

Analysis of stress and strains in bodies under the action of loads. Moor's circle. The concept of strain energy and its applications. Laboratory. Prerequisite: CE 15.

121. SOIL MECHANICS AND FOUNDATION DESIGN

Theoretical and experimental methods of analysis of the physical properties of soils. Design of earth structures. Introduction to the design and analysis of various types of foundations. Laboratory. Prerequisites: CE 116 and CE 20.

130. STRUCTURAL ANALYSIS I

Analysis of stresses in statically determinate structures under stationary loads. Roof and bridge trusses. Straight and curved beams. Frames. Three-hinged arches. Influence lines for beams. Prerequisite: CE 116.

131. STRUCTURAL ANALYSIS II

Influence lines for bridge trusses and simple arches. Analysis of deformations of structures. Introduction to statically indeterminate structures and the analysis of building frames using

moment-distribution method. Introduction to plastic analysis. Prerequisite: CE 130.

133. STRUCTURAL STEEL DESIGN

Riveted and welded connections. Tension and compression members. Floor systems and roof trusses. Detailing and shop practice. Industrial buildings. Bridges. Prerequisite: CE 130.

135. REINFORCED CONCRETE DESIGN

Analysis and design of reinforced concrete structures. Introduction to elementary concepts of plastic theory and the theory of prestressed concrete. Concrete mixes and construction methods. Prerequisite: CE 130.

140. HYDRAULIC AND SANITARY ENGINEERING

Descriptive and quantitative hydrology. Collection, storage and distribution systems. Dams, reservoirs, and canals. Sewage treatment plants. Introduction to the chemical and biological processes in water purification and sewage treatment. Prerequisite: Fluid Mechanics.

145. HIGHWAY DESIGN AND CITY PLANNING

Highway planning, economy, and finance. Highway design, construction, and maintenance. Pavements and bases. Principles of city and regional planning. Prerequisite: CE 121

All candidates for the B.S. degree in Civil Engineering are required to carry out a thesis project during their senior year, to participate in the engineering seminar, and to submit an acceptable thesis to the Department prior to graduation.

Courses Open to Undergraduate and Graduate Students

150. ADVANCED STRENGTH OF MATERIALS I (2)

Beams on elastic foundation. Curved beams. Thin rings. Bending of beams with nonsymmetrical corssection, principal axes of inertia and principal moments of inertia. Moor's circle in three dimensions.

154. STATICALLY INDETERMINATE STRUCTURES I (2)

Thermal stresses. Stresses due to foundation settlements. Stresses due to shrinkage and creep of structural materials. Application to trusses, beams, frames, and arches.

155. STATICALLY INDETERMINATE STRUCTURES II (2)

Deformations of statically indeterminate structures. Iterative methods of analysis. Space frames. Application of digital computers. Influence lines. Prerequisite: CE 154.

157. THEORY OF PLATES (2)

Methods of analysis of rectangular plates under various loading and support conditions. Fourier series, energy methods and numerical finite difference methods. Analysis of circular plates.

158. THEORY OF SHELLS I (2)

Membrane theory of shells of revolution. Cylindrical shells, shell roofs, tanks. Bending theory of cylindrical shells.

160. THEORY OF PLASTICITY I (2)

Analysis of stresses and strains in materials loaded beyond the elastic limit. Perfectly plastic materials. Bending of beams and torsion of shafts. Yield hinges, limit analysis. Application to trusses and frames.

161. EXPERIMENTAL STRESS ANALYSIS (2)

Theory and practice of the photoelastic method for measuring stresses under static and dynamic loads. Moire screen method in photoelasticity. Electrical strain gages and rosettes, and their use in static and dynamic testing. Mechanical and optical strain gages.

165. DYNAMICS OF STRUCTURES I (2)

Introduction to the analysis of behavior of structures under time-dependent loads. Natural frequencies of structures. Response of structures to various types of dynamic loading. Exact and approximate methods.

168. THEORY OF STABILITY OF STRUCTURES I (2)

Stability analysis of elastic bars under axial and combined axial load and bending. Columns with elastic restraints. Analysis of frames. Energy methods.

170. ADVANCED MECHANICAL PROPERTIES OF MATERIALS (2)

Theory of flow and fracture of engineering materials. Mechanical properties of engineering materials at low and elevated temperatures. Effect of radiation on mechanical properties. Laboratory investigations in creep, fatigue, and impact. Nondestructive testing.

175. ADVANCED SOILS ENGINEERING (2)

Theory of clay mineralogy. Soil compaction characteristics and equipment. Consolidation of soils, time-settlement relationship. Slope and foundation stability. Design, and remedial treatments of soft foundations.

178. ADVANCED SANITARY ENGINEERING (2)

Advanced aspects of the physical, chemical, and biological processes involved in water purification and in sewage and waste treatment. Principles of the design and operation of treatment plants. Special aspects of industrial waste treatment.

190. INDEPENDENT RESEARCH

Open to Departmental Scholars only.

199. INDEPENDENT STUDY

Open to Departmental Scholars only.

210. ADVANCED STRENGTH OF MATERIALS II (2)

Thick-walled rings. Shrink-fit stresses. Beam analysis, using Fourier series. Torsion of thin-walled sections. Shear center. Theories of failure. Nonlinear problems in beam bending. Strain energy.

212. THEORY OF ELASTICITY I (2)

Fundamentals of the classic theory of elasticity. Stress and strain in three dimensions. Plane stress and plane strain. Stress function. Problems in rectangular and polar coordinates. Analysis of stresses around holes and in the vicinity of localized loads.

213. THEORY OF ELASTICITY II (2)

Torsion of noncircular shafts. Contact stresses. Numerical methods and application of the digital computer. Application of conformal mapping and use of complex variables in solving plane stress problems. Prerequisite: CE 212.

215. THEORY OF PLASTICITY II (2)

Introduction to mathematical theory of plasticity. Plastic analysis of plates and rings. Shake-down phenomena. Visco-elastic behavior of materials. Creep phenomena. Prerequisite: CE 160.

217. THEORY OF SHELLS II (2)

Bending theory of shells. Stress function and numerical methods in shell analysis. Shells of negative curvature and shallow shells. Shells of variable thickness. Prerequisite: CE 158.

219. DYNAMICS OF STRUCTURES II (2)

Analysis of the dynamic behavior of multistory frames. Matrix methods. Application of digital computers. Theoretical foundations of earthquake analysis. Dynamic response of elastic bodies, beams, plates. Prerequisite: CE 165.

220. THEORY OF STABILITY OF STRUCTURES II (2)

Refined methods of stability analysis of frames. Stability of rings and arches. Lateral stability of beams. Stability of plates. Introduction to stability of shells. Stability of structures in the inelastic range. Prerequisite: CE 168.

225. AIRCRAFT AND MISSILE STRUCTURES I (2)

Applications of principles of engineering mechanics. Strain energy methods. Castigliano's theorems. Space frameworks. Thin-walled structures. Stability. Matrix methods. Use of electronics computers. Prerequisite: CE 150.

226. AIRCRAFT AND MISSILE STRUCTURES II (2)

Shear lag problems. Application of methods of limit analysis. Stability of thin-walled sections in torsion and in bending. Thermoelasticity and application of matrix methods. Honeycomb structures. Properties and applications of nonmetallic materials. Prerequisite: CE 225.

230. THERMAL STRESSES (2)

Formulation and solution of thermoelastic problems. Analysis of beams, rings, frames, trusses, and plates. Thermoelastic stability and thermal stress analysis for inelastic systems. Prerequisite: CE 150.

235. IMPACT, SHOCK, AND WAVE PROPAGATION (2)

Elementary concepts of longitudinal wave propagation in bars, spalling, transform techniques of analysis; plastic waves and shocks in bars. Introduction to elastic waves in three dimensions and impact buckling.

299. M. S. THESIS (1 to 6)

By arrangement with the Department.

ELECTRICAL ENGINEERING (EE)

RICHARD C. DORF, PHD., *Chairman*

Electrical Engineering includes the design, construction, and operation of equipment for generation, transmission, and utilization of electrical energy. Electrical engineers are concerned with all phases of the electrical transmission of information such as radio, television, and telephone. Data processing equipment and computers used by business, industry, and government are included in their major area of interest. Much of the equipment used in maintaining our national security is powered and controlled by electric and electronic mechanisms.

101. PRINCIPLES OF ELECTRICAL ENGINEERING I

Parameters of electrical components, introduction to circuit theory, principles of electromechanical energy conversion, transient and steady-state behavior of electrical systems. Laboratory. Prerequisites: PH 4B, MA 21.

102. PRINCIPLES OF ELECTRICAL ENGINEERING II

A continuation of EE 101 to include the basic principles of energy conversion. Introduction of the basic principles of electronics. Elementary theory of vacuum, gas, and solid state electronic devices. Applications to basic electronic circuits as used in communications and industrial electronic systems. Laboratory. Prerequisite: EE 101.

103. ELECTRICAL INSTRUMENTATION AND CONTROL

Introduction to system theory analysis, determination of models for electromechanical and electronic equipment. Analytical techniques for both open- and closed-loop control systems. For non-Electrical Engineering majors. Laboratory. Prerequisite: EE 101.

104. FUNDAMENTALS OF ELECTROMAGNETIC FIELDS

Static electric and magnetic fields, dielectric and magnetic materials. Time-varying fields. Transmission line theory. Introduction to antennas and propagation. Prerequisite: EE 101.

108. MICROWAVE THEORY AND TECHNIQUES

A combined lecture and laboratory course covering generation, propagation, and detection of microwave energy. Experiments on klystrons, impedance measurements, antenna radiation patterns, and the characteristics of passive microwave devices. Laboratory. Prerequisite: EE 104.

111. NETWORK ANALYSIS

Loop-basis and node-basis network analysis, elementary network

topology, Laplace transforms, network functions, poles and zeros. Prerequisite: EE 101.

112. INTRODUCTION TO NETWORK SYNTHESIS

An introduction to modern synthesis methods, properties of driving-point and transfer functions. Methods of synthesis of LC, RC, and RLC one-port networks. Approximations. Linear filter theory. Prerequisite: EE 111.

113. ANALYSIS OF LINEAR SYSTEMS (2)

Formulation of loop and node equations, network theorems, transfer functions, operational methods, including Laplace and Fourier integrals, s-plane analysis. Prerequisite: EE 101.

131. CONTROL SYSTEMS

The mathematical theory of linear feedback control systems is considered in detail. Topics include: transfer functions, relation between time and frequency domain characteristics; analysis and design, using root locus concepts and frequency response plots; performance criteria and sensitivity; stability. Laboratory. Prerequisite: EE 114.

132. AUTOMATIC FEEDBACK CONTROL SYSTEMS (2)

Introduction to analysis of feedback systems. Stability frequency and time response. Nyquist, Bode, and Nichols plots. Root locus, steady-state error. Prerequisite: EE 113.

151. ELECTRONICS I

Electron ballistics, emission theory, semiconductor theory. Extension of the study of electronic amplifiers to include wideband and radio frequency amplifiers, and the principles and applications of feedback. Laboratory. Prerequisites: EE 102, EE 111.

152. ELECTRONICS II

Continuation of EE 151, to develop features of high-frequency power amplifiers, oscillators, modulation systems. Communications systems. Introduction to nonlinear electronic circuits. Laboratory. Prerequisite: EE 151.

161. ELECTROMECHANICAL ENERGY CONVERSION

Introduction to energy conversion equations and applications to transducers, rotating amplifiers. Machine dynamics, transfer function realization, and modeling of physical electromechanical systems. Laboratory. Prerequisites: EE 102 and EE 114.

162. ELECTRICAL POWER SYSTEMS

Introduction to analysis of power networks, symmetrical components, digital computer load study programming. Balanced and unbalanced fault studies, circuit protection and relaying. Stability analysis of system dynamics under fault, equal-area criterion and computer analysis. Prerequisite: EE 161

190. UNDERGRADUATE RESEARCH

Open to Departmental Scholars only.

198. SENIOR THESIS AND SEMINAR

Investigation of an approved electrical engineering problem and preparation of suitable thesis covering the investigation. Conferences as required. The seminar will be presented by the student during the term, covering suitable topics.

199. INDEPENDENT STUDY

Open to Departmental Scholars only.

201. ELECTROMAGNETIC FIELD THEORY I (2)

Time-varying electromagnetic field concepts starting with Maxwell's equations. Use of electric and magnetic vector potentials. Field theorems. Reflection and refraction of plane waves at interfaces. Rectangular wave guides and resonators. Boundary value problems in cartesian coordinates. Prerequisite: EE 104.

202. ELECTROMAGNETIC FIELD THEORY II (2)

Cylindrical and spherical wave functions. Circular wave guides and resonators. Spherical cavities. Boundary value problems in cylindrical and spherical coordinates. Prerequisite: EE 201.

203. MICROWAVE NETWORKS I (2)

Elements of microwave networks. Wave guide and coaxial line components. Wave-guide impedance-matching elements, phase shifters, attenuators. Magic tee, wave meters, directional couplers. Prerequisite: EE 201.

204. MICROWAVE NETWORKS II (2)

General microwave transmission theory. Methods of analysis including the use of matrix algebra to microwave networks. Waveguide junctions and other microwave networks. Prerequisite: EE 203.

205. ACTIVE MICROWAVE DEVICES (2)

Microwave detectors, amplifiers, and oscillators. Klystrons, mag-

netrons, traveling wave tubes, masers, and ferrites. Prerequisite: EE 201.

206. ANTENNAS I (2)

An introductory course in antennas. Generalized antenna problem from assumed currents. Analysis of basic antennas; elementary dipole, thin linear antennas, loops, helical antennas, reflectors, horn antennas, and arrays. Prerequisite: EE 201.

207. ANTENNAS II (2)

A continuation of EE 206. Frequency independent antennas, biconical antennas, log-periodic antennas, conical spirals, signal processing antennas. Prerequisite: EE 206.

209. TOPICS IN ELECTROMAGNETIC FIELD THEORY (2)

211. MODERN NETWORK ANALYSIS I (2)

A study of network theory from modern points of view: Fundamental concepts, loop and node systems of equations, matrix methods, elementary topology, and network theorems. Prerequisites: EE 111; credit or registration in Complex Variables, AM 135.

212. MODERN NETWORK ANALYSIS II (2)

Continuation of EE 211. Frequency analysis of excitation and response, study of network responses, using Laplace transformation methods and superposition integral, network functions and their properties. Prerequisite: EE 211.

213. LINEAR SYSTEM ANALYSIS (2)

Mathematical methods in the design and analysis of linear systems: complex variables, Fourier and Laplace transforms, signal-flow diagram, stability problems, and selected topics. Prerequisite: EE 211.

214. NETWORK GRAPH THEORY (2)

Introduction to the theory of graphs: formulation of topological basis of mesh and node methods by means of matrix transformations, proofs of network theorems, and topological analysis and synthesis of electrical networks. Prerequisite: EE 211.

215. NETWORK SYNTHESIS I (2)

A study of various methods for the synthesis of passive networks for prescribed driving-point and transfer characteristics. Prerequisite: EE 211.

216. NETWORK SYNTHESIS II (2)

A continuation of EE 215. Synthesis of passive two-ports: ladder development, resistively terminated networks, double-terminated networks, image parameter method, approximations. Prerequisite: EE 215.

217. NETWORK SYNTHESIS III (2)

A continuation of EE 216. Introduction to n-port synthesis, topological synthesis, selected topics. Prerequisite: EE 216.

219. TOPICS IN NETWORK THEORY

221. DIGITAL COMPUTERS I (2)

Fundamentals of Boolean algebra, determination of Boolean equations of logic elements, logical design of arithmetic and control units.

222. DIGITAL COMPUTERS II (2)

Digital computer memories, input-output equipment, circuit design of logic elements, design of special-purpose digital computers. Prerequisite: EE 221.

223. SWITCHING CIRCUITS (2)

Graphical and algebraic representation of switching functions. Analysis of contact and gate networks with hazards. Synthesis of networks using linear-input threshold elements. Introduction to analysis and synthesis of sequential circuits.

224. ANALOG COMPUTER SIMULATION (2)

Simulation of linear and nonlinear equations, representations of transfer functions. Nonlinear function generation, diode networks, relay systems. Magnitude and time scaling. Laboratory. Prerequisite: Differential equations.

225. ANALOG/HYBRID COMPUTER SIMULATION (2)

Introduction to simulation by hibrid methods. Includes systems using analog logic and storage, systems using digital logic and control. Parameter optimization, iteration. Prerequisite: EE 222.

231. DESIGN OF FEEDBACK CONTROL SYSTEMS (2)

Design of linear, continuous control systems utilizing techniques for the frequency response method and the root-locus method. Time and frequency response correlation and steady-state analysis is discussed. Prerequisite: EE 131.

232. ANALYSIS AND DESIGN OF NONLINEAR FEEDBACK CONTROL SYSTEMS (2)

Graphical and analytical techniques for analyzing nonlinear systems. Phase plane and describing function techniques applied to relay servos, dual mode servos, and servomechanisms with discontinuous damping. Prerequisite: EE 131.

233. INTRODUCTION TO SAMPLED-DATA SYSTEMS (2)

Introduction to the analysis of systems operating on discrete signals, by means of transformation calculus and state space techniques. Prerequisite: EE 131 or equivalent.

234. SYNTHESIS OF SAMPLED-DATA SYSTEMS (2)

Continuation of EE 233. Design of control systems by pulsed networks and digital controllers. Multivariate sampling. Optimum system design. Statistical design of sampled systems. Nonlinear systems. The Z transform and the state variable methods will be used. Prerequisite: EE 233.

235. NONLINEAR CONTROL SYSTEM THEORY (2)

Introduction to dominant mode analysis. Design and compensation with nonlinear elements and time-varying parameters. Adaptive control systems. Prerequisite: EE 131.

236. INTRODUCTION TO STATE SPACE TECHNIQUES (2)

The concepts of state and state equations are introduced. The state vector and state equations of differential equations are presented. Determination of stability by Liapunov's method is introduced. Prerequisite: EE 131.

237. GUIDANCE AND CONTROL LAWS FOR AEROSPACE VEHICLES (2)

Linearization of nonlinear trajectories. Introduction to optimization of control systems. Kalman's prediction method. Prerequisite: EE 236.

238. STATISTICAL CONTROL THEORY (2)

Analysis and design of control systems responding to stochastic input signals. Kalman's prediction methods. Analysis of noise in systems. Design of optimum response for continuous control and guidance systems. Prerequisite: EE 236.

239. TOPICS IN CONTROL THEORY (2)

241. THEORY OF COMMUNICATION (2)

Introduction to information transmission, transmission through

electronic networks, modulation and modulation systems, periodic sampling and pulse modulation, noise. Prerequisite: EE 113.

242. INFORMATION THEORY I (2)

An introduction to the fundamental concepts of information theory, including the quantitative measure of information, entropy, and channel capacity for both discrete and continuous systems. Prerequisite: AM 110.

243. INFORMATION THEORY II (2)

A continuation of EE 242. Network analysis with random signals and noise. Statistical decision theory applications. Prerequisite: EE 242.

244. ERROR DETECTION AND CORRECTION CODING (2)

Treatment of block codes; their structure and their capabilities, including cyclic codes for burst error detection and correction. The implementation of encoding and decoding algorithms for cyclic codes is discussed. Prerequisite: AM 140.

251. FUNDAMENTALS OF TRANSISTORS AND CIRCUITS (2)

Physics of transistors, equivalent circuits, simple amplifiers. Prerequisite: EE 152.

252. TRANSISTOR CIRCUIT DESIGN (2)

Stability, low-frequency response, feedback, D.C. amplifiers, power amplifiers, power supplies. Prerequisite: EE 251.

253. HIGH-FREQUENCY TRANSISTOR CIRCUITS (2)

High-frequency equivalent circuits, neutralization, tuned amplifiers (signal), tuned amplifiers (power), switching characteristics, noise problems. Prerequisite: EE 252.

254. WIDE-BAND AMPLIFIERS I – LOW PASS (2)

Special equivalent circuits, complex frequency step response, high-frequency response, rise-time analysis, frequency response vs. time response. Prerequisite: EE 252.

255. WIDE-BAND AMPLIFIERS II – BAND PASS (2)

Tuned amplifiers, interstage transfer functions, complex plane representation, filter amplifiers, gain functions. Prerequisite: EE 254.

256. WIDE-BAND AMPLIFIERS III – LADDER NETWORK AMPLIFIERS (2)

Law-pass to band-pass transformations, design data, impedance

transformers, double-tuned and triple-tuned interstages, additive amplifiers. Prerequisite: EE 255.

257. TIMING AND PULSE GENERATION (2)

Regenerative switching and wave-form generation, effects of inductance in switching and pulse circuits, pulse-forming circuits and high-power pulse amplifiers. Prerequisite: EE 263.

259. TOPICS IN ELECTRONIC CIRCUITS (2)

261. INTRODUCTION TO SATURATING MAGNETIC DEVICES (2)

The physical theory of ferromagnetism and ferrimagnetism is introduced as a basis for the piecewise linear analysis of torroidal magnetic cores. A general method of analysis of circuits containing saturating magnetic devices is applied to representative examples, including static inverters, logic circuits, memory matrices, and magnetic amplifiers. Prerequisites: EE 113 and EE 151 or equivalent.

262. DESIGN OF SATURATING MAGNETIC DEVICES (2)

Design procedures are developed from the physical characteristics of the devices, and from the results of the piecewise-linear analysis. Prerequisite: EE 261.

263. SWITCHING DEVICES (2)

Suitable equivalent circuits. Semiconductor switching characteristics: delay, storage time, recovery time, charge control parameters. Circuit techniques: circuit theorems, solution of differential equations with boundary values by inspection. Elementary switching applications. Prerequisite: EE 251.

264. INTRODUCTION TO SEMICONDUCTOR DEVICE THEORY I (2)

Crystal structure, semiconductor materials, electron energy distributions, charge carrier particles and their relationships, junction physics, semiconductor devices. Prerequisites: EE 251 and a course in Modern Physics.

265. INTRODUCTION TO SEMICONDUCTOR DEVICE THEORY II (2)

Continuation of EE 264 with more emphasis on the Quantum Mechanical Basis. Prerequisites: EE 264 and a course in Quantum Mechanics.

271. BIOLOGICAL SYSTEMS THEORY I (2)

Lectures, class discussions, and reading assignments introducing the application of control systems theory to biological systems, thus providing a unifying concept for discussion of topics related to biological information and genetic continuity, energy cycles, and interactions with the environment.

272. BIOLOGICAL SYSTEMS THEORY II (2)

Lectures, class discussions of selected topics related to: Growth and development, respiration, transport mechanisms, and the activity of the central nervous system with respect to control-system analysis and biological order. Prerequisite: EE 271.

273. BIOLOGICAL COMMUNICATION AND CONTROL SYSTEMS (2)

Designed to give an understanding of the emerging principles of biological communication and control systems. Introductory discussion of sensory transducers, coding, and the organization of the central nervous system. Analysis of biological control systems and human neurological servomechanisms. Prerequisites: Graduate standing in the Engineering College, EE 131 or equivalent.

274. BIOENGINEERING MEASUREMENTS (2)

Problems involved in measurements, data presentation and reduction. Selected examples of electric and mechanical measurements in animal systems. Prerequisite: EE 271.

299. ELECTRICAL ENGINEERING PROBLEMS (2-4 units)

Special Electrical Engineering problems. By arrangement.

300. THESIS RESEARCH (3-9 units)

Electrical Engineering research conducted under the supervision of a faculty advisor. Preparation of a suitable written thesis covering the investigation.

MECHANICAL ENGINEERING (ME)

RICHARD K. PEFLEY, M.E., *Chairman*

Mechanical Engineering attracts those engineers who are interested in propulsion, ranging from hydraulic jets and propellors to rockets; in power generation, ranging from solar heat engines to nuclear power plants; in explosions of all types, extending from the housed explosion in the internal combustion engine to free bomb-type explosion; in heating, refrigeration, and air conditioning, ranging in application from human comfort to the cooling of vacuum tubes; in structures subjected to motion, extending from printing presses and calculators to guided missiles.

Mechanical engineers are concerned not only with the design of this variety of machines, products, and equipment, but also with the design and operation of the factories, mills, and plants in which manufacturing and processing take place.

UNDERGRADUATE COURSES

10. DESIGN I

Fortran programming; principles of orthographic projection and descriptive geometry. Graphic analysis of lines. Surface areas and volumes. Methods and solutions for simple design problems are presented.

11. DESIGN II

Description of physical properties of materials and methods of alteration. Evaluation of these properties by experimentation in heat treatment, machining, and welding.

15. MATERIAL SCIENCE

Physical basis of the electrical, mechanical, and thermal behavior of solids. Relations between structural and physical properties. Theory dislocations, vacancies, and other defects and their effect on physical properties. Prerequisites: Physics, Chemistry.

110. MACHINE DESIGN I

Analytical and graphical analysis of linkages, utilizing statics, dynamics, and strength of materials. Machine elements studied will include electromechanical and pneumatic-hydraulic components. Prerequisites: CE 116, ME 11.

111. MACHINE DESIGN II

Continuation of Machine Design I. System analysis and synthesis will be studied, including control systems. Prerequisite: ME 110.

120. THERMOFLUID MECHANICS I

Consideration of thermofluid properties of matter, Newton's laws

of motion, and the laws of thermodynamics. Emphasis is placed on the application of these principles to the analysis of fluid systems. Laboratory work emphasizes dimensional analysis as a guide to experimental studies of fluid flow. Prerequisite: CE 15.

121. THERMOFLUID MECHANICS II

Continuation of ME 120. Emphasis is placed on control volume analyses of thermofluid systems and on the implications of the second law of thermodynamics for such systems. Laboratory work stresses evaluation of system performance. Prerequisite: ME 120.

122. THERMOFLUID MECHANICS III

Continuation of ME 121 with emphasis on compressible flow, nonreactive and reactive mixtures of substances. Laboratory work includes analysis of modern energy conversion systems. Prerequisite: ME 121.

125. THERMODYNAMICS

Thermodynamic potentials and availability concepts. Further work on analysis of reactive mixtures with emphasis on the thermodynamics of combustion and chemical equilibrium. Prerequisite: ME 122.

130. THERMOFLUID MECHANICS I-C

Similar to ME 120, but with applications and laboratory work slanted toward Civil Engineering. Prerequisite: CE 15.

131. THERMOFLUID MECHANICS II-C

Similar to ME 121, but with applications and laboratory work slanted toward Civil Engineering. Prerequisite: ME 130.

135. HEAT TRANSFER

Introduction to the concepts of conduction, convection, and radiation heat transfer, and application of these concepts to engineering problems. Prerequisite: ME 121.

136. PROPULSION SYSTEMS

Common parameters for evaluation of marine, terrestrial, and space propulsion systems. Description and analysis of various types of propulsion systems. Prerequisite: ME 121.

140. ADVANCED DYNAMICS

Dynamics of a particle and of a system of particles. Lagrangian equations. Application to engineering problems, including vi-

brations, gyroscopic motion, and central-force field trajectories. Prerequisite: CE 110 or CE 111.

142. ADVANCED FLUID MECHANICS I

Mechanics of laminar and turbulent flow. Introduction to potential flow and boundary-layer theory. Application to selected topics in lubrication theory, aerodynamics, and turbomachinery. Prerequisite: ME 121.

143. ADVANCED FLUID MECHANICS II

Application of fluid mechanics principles to flow in piping networks and manifolds. Transient phenomena, including water hammer. Analysis of systems containing turbomachinery. Prerequisite: ME 142.

198. THESIS AND SEMINAR

Investigation of an engineering problem and writing of an acceptable thesis. Conferences as required. Prerequisite: Senior standing in Mechanical Engineering.

199. INDIVIDUAL STUDY

By special arrangement with the Chairman of the Department. Credit by arrangement.

Courses Primarily For Graduates

210. NONLINEAR OSCILLATIONS I (2)

Phase plane and phase trajectories, theorem of Cauchy-singular points – trajectories and motions, method of isoclines, topology of phase trajectories in the neighborhood of singular points, separatrix, Poincaré's theorem, stability in the sense of Liapounoff, limit cycles – definition, analytical examples. Two-hour lecture. Prerequisites: Differential Equations and Dynamics.

211. NONLINEAR OSCILLATIONS II (2)

Indices of Poincaré, theorems of Bendixson, bifurcation theory (Poincaré), self-excitation of mechanical and electromechanical systems, limit cycles in the Van der Pol and Lienard planes, cylindrical phase trajectories of conservative and nonconservative systems, method of Poincaré, method of Van der Pol. Two-hour lecture. Prerequisite: ME 210.

212. NONLINEAR OSCILLATIONS III (2)

Theory of the first approximation of Kryloff and Bogoliuboff,

method of equivalent linearization of Kryloff and Bogoliuboff, nonlinear resonance, subharmonics and frequency demultiplication, external periodic excitation of quasilinear systems, parametric excitation, relaxation oscillations. Two-hour lecture. Prerequisite ME 211.

215. ADVANCED DYNAMICS I (2)

Dynamics of a particle, solution of rectilinear and oscillatory motion for linear and quadratic damping, large-angle oscillations, self-excited oscillations, Duhamel integral. Two-hour lecture. Prerequisite: Differential Equations.

216. ADVANCED DYNAMICS II (2)

Momentum and energy theorems, motion of systems with variable mass, relative motion, generalized coordinates and forces, Lagrangian equations, time-dependent constraints, applications to physical problems. Two-hour lecture. Prerequisite: ME 215.

217. ADVANCED DYNAMICS III (2)

Free and forced motion of gyroscopes, gyroscopic moments, stability of gyroscopic motion, theory of small vibrations, free and forced oscillations of systems with several degrees of freedom. Two-hour lecture. Prerequisite: ME 216.

220. CELESTIAL MECHANICS I (2)

Review and extension of conic geometry and spherical trigonometry, the Kepler orbit, problems in ideal orbits, orbit determination, Newtonian modifications to the Kepler planetary system, alternative formulations of and approaches to orbital mechanics, error analysis, applications of orbit mechanics to atomic physics. Two-hour lecture. Prerequisites: Differential Equations and Dynamics.

221. CELESTIAL MECHANICS II (2)

Potential theory, perturbation theory, satellite motion about oblate earth, effects of atmosphere on satellite orbits, physics of the solar system. Two-hour lecture. Prerequisite: ME 220.

222. CELESTIAL MECHANICS III (2)

Powered trajectories, ascent and re-entry, orbital maneuvers, attitude control, mission analysis, lunar and interplanetary flight. Two-hour lecture. Prerequisite: ME 221.

225. GAS DYNAMICS I (2)

Flow of compressible fluids including one-dimensional isentropic

flow, normal shock waves, frictional flow. Two-hour lecture. Prerequisite: ME 121.

226. GAS DYNAMICS II (2)

Continuation of ME 225, including effects of heat transfer and generalized one-dimensional flow. Oblique shocks and two-dimensional potential flow. Two-hour lecture. Prerequisite: ME 225.

227. GAS DYNAMICS III (2)

Continuation of ME 226, with emphasis on the method of characteristics for supersonic flow. Two-hour lecture. Prerequisite: ME 226.

228. GAS DYNAMICS IV (2)

Flow of gases analyzed from a microscopic viewpoint. Two-hour lecture. Prerequisites: ME 225 and ME 230.

230. STATISTICAL THERMODYNAMICS (2)

Kinetic theory of gases, Maxwell-Boltzmann distributions, thermodynamic properties in terms of partition functions, quantum statistics and applications. Two-hour lecture. Prerequisites: Differential Equations and ME 121.

234. COMBUSTION (2)

Theory of combustion processes. Reaction kinetics, flame propagation theories. Two-hour lecture. Prerequisites: Differential Equations and ME 121.

236. CONDUCTIVE HEAT TRANSFER (2)

Flow of heat through solid and porous media for steady and transient conditions. Consideration of stationary and moving heat sources. Two-hour lecture. Prerequisites: Differential Equations and ME 135.

238. CONVECTION HEAT AND MASS TRANSFER (2)

Advanced problems in heat and mass transfer, with emphasis on convective heat and mass transport. Two-hour lecture. Prerequisite: ME 135.

240. RADIATION HEAT TRANSFER (2)

Introduction to concepts of quantum mechanics, black body behavior and radiant heat exchange between real bodies. Two-hour lecture. Prerequisite: ME 135.

245. AEROSPACE HEAT TRANSFER (2)

Heat transfer associated with high-speed, high-altitude aircraft and missiles. Two-hour lecture. Prerequisite: ME 135 or ME 238.

250. NUCLEAR REACTORS I (2)

Design, kinetics, and control of nuclear reactors. Two-hour lecture. Prerequisites: PH 115 and Differential Equations.

251. NUCLEAR REACTORS II (2)

Problems in the design of nuclear power plants. Two-hour lecture. Prerequisite: ME 250.

252. NUCLEAR REACTORS III (2)

Continuation of ME 251. Two-hour lecture. Prerequisite: ME 251.

255. ADVANCED PROPULSION SYSTEMS (2)

Advanced topics in the analysis of propulsion systems, with emphasis on recently conceived systems. Two-hour lecture. Prerequisite: ME 136.

260. PROBABILITY AND STATISTICS FOR OPERATIONS RESEARCH (2)

Introduction to elementary probability and statistical methods useful in operations research. The normal, binomial, multinomial, hypergeometric, geometric, Poisson, Chi square, and t-distributions. Applications to engineering problems.

261. OPERATIONS RESEARCH I (2)

Problem formulation, inventory control, replacement, allocation, sequencing, linear programming, game theory, queuing theory, and decision theory. Applications and decisions-making procedures. Prerequisite: ME 260 or equivalent.

262. OPERATIONS RESEARCH II (2)

Continuation of ME 261. Prerequisite: ME 261.

270. PHYSICAL PROPERTIES FROM THE MOLECULAR VIEWPOINT (2)

Microscopic theories of deformation and fracture. Electrical, thermal, and magnetic properties of materials. Two-hour lecture. Prerequisite: PH 115.

272. VISCOUS FLOW THEORY I (2)

Navier-Stokes equations with Prandtl boundary-layer simplifications. Solutions for incompressible laminar and turbulent flow. Prerequisites: ME 121 and AM 130 or equivalent.

273. VISCOUS FLOW THEORY II (2)

Energy equation including heat conduction. Solutions for incompressible thermal boundary layers. Compressibility effects. Prerequisite: ME 272.

274. VISCOUS FLOW THEORY III (2)

Boundary layers in hypersonic flow, including effects of mass addition, dissociation, and chemical reactions. Prerequisite: ME 273.

276. THE NATURE OF TURBULENCE (2)

An introduction to turbulence phenomena, parameters, idealizations, and approximate methods of analysis. Prerequisite: ME 142 or equivalent.

278. MATHEMATICAL HYDRODYNAMICS (2)

Mathematical analysis of incompressible inviscid flow. Equations of motion, irrotational flow in two and three dimensions, vortex motion, free-surface flows. Two-hour lecture. Prerequisites: ME 121 and concurrent registration in AM 135.

280. MAGNETOFLUID MECHANICS (2)

Flow of electrically conducting fluids under the influence of electric, magnetic, and mechanical forces. Two-hour lecture. Prerequisite: A course in Field Theory.

298. SPECIAL PROBLEMS (3 to 9 units)

By arrangement

299. RESEARCH M.S. THESIS (3 to 9 units)

By arrangement with the Department

PHYSICS (PH)

The following courses will be scheduled in conjunction with the early-morning engineering graduate program.

125. ELEMENTARY MODERN PHYSICS (2)

Special relativity. Quantum effects. The hydrogen atom. Many-electron atoms. X-rays. Nuclear structure and nuclear reactions.

135A. PHYSICS OF SOLIDS (2)

The crystalline state. Theories of specific heat. Metallic lattices. Dielectric properties of insulators. Free-electron theory of metals: Prerequisite: PH 115 or equivalent.

135B. PHYSICS OF SOLIDS (2)

Continuation of 116A. Band theory of solids. Electron distribution in insulators. Nonpolar semiconductors. Rectifiers and transistors. Diamagnetism and paramagnetism. Prerequisite: PH 116A.

145A. ATOMIC PHYSICS (2)

Magnetic, electrical, and optical properties of atoms. X-rays and X-ray spectra. Optical spectra. Electron spin and multiplet spectra. Prerequisites: PH 115 and PH 180A.

145B. NUCLEAR PHYSICS (2)

Review of natural and artificial radioactivity. Detailed study of alpha, beta, and gamma decay. Nuclear forces and nuclear structure. Prerequisite: PH 115.

155A. QUANTUM MECHANICS I (2)

The Schrodinger Equation. Free particle. Linear harmonic oscillator. Barrier problems. General methods for one-dimensional problems. Three-dimensional problems. Prerequisite: PH 115.

155B. QUANTUM MECHANICS II (2)

Time-independent perturbation theory. Time-dependent perturbation theory. General formulation of quantum mechanics and applications. Prerequisite: PH 180A.

COURSES IN OTHER DEPARTMENTS OF THE UNIVERSITY OF INTEREST TO ENGINEERS

Chemistry 3A	Chemistry for Engineers
Chemistry 3B	Chemistry for Engineers
Mathematics 1	Algebra and Trigonometry
Mathematics 11	Analytical Geometry and Calculus I
Mathematics 12	Analytical Geometry and Calculus II
Mathematics 13	Analytical Geometry and Calculus III
Mathematics 21	Calculus and Differential Equations

(continued)

Physics 4A	Physics for Scientists and Engineers I
Physics 4B	Physics for Scientists and Engineers II
Physics 4C	Physics for Scientists and Engineers III
Physics 4D	Physics for Scientists and Engineers — Modern Physics
Physics 130A	Methods of Mathematical Physics I
Physics 130B	Methods of Mathematical Physics II
Bus. Adm. 1A, 1B, 1C	Fundamentals of Accounting
Bus. Adm. 133	Cost Accounting
Bus. Adm. 157	The Elements of Management Science
Bus. Adm. 160	Organization and Management
Bus. Adm. 162	Business Policies and Management

FACULTY

Peter J. Aline (1963) Ph.D.
Lecturer in Mechanical Engineering

John D. Bruce (1962) Ph.D.
Assistant Professor of Electrical Engineering

Robert F. Burt (1962) M.S.
Lecturer in Mechanical Engineering

Shu-Park Chan (1962) Ph.D.
Associate Professor of Electrical Engineering

Charles H. Chicks (1964) Ph.D.
Lecturer in Mathematics

Grosman J. Clark (1964) Ph.D.
Lecturer in Mathematics

Audrey M. Davison (1964) A.M.
Lecturer in Bio-Engineering

Charles H. Dawson (1961) PhD.
Registered Professional Engineer, Lecturer in Electrical Engineering

Richard C. Dorf (1963) Ph.D.
Chairman and Associate Professor of Electrical Engineering

Galen E. Etamad (1962) Ph.D.
Lecturer in Mechanical Engineering

Eugene J. Fisher (1954) B.M.E.
Registered Professional Engineer, Instructor in Mechanical Engineering

Edmund C. Flynn, M.S.
Emeritus Professor

FACULTY

Wade H. Foy (1964) Ph.D.
Lecturer in Electrical Engineering

Henry V. Hahne (1959) Ph.D.
Chairman and Associate Professor of Civil Engineering

George G. Herzl (1963) Ph.D.
Lecturer in Mechanical Engineering

Verner E. Hoggatt, Jr. (1963) Ph.D.
Lecturer in Mathematics

Edward A. Huber (1963) Ph.D.
Lecturer in Electrical Engineering

Mamoru Inouye (1962) M.S.,
Registered Professional Engineer, Lecturer in Mechanical Engineering

Harmon W. Johnson (1962) M.S.
Lecturer in Electrical Engineering

Robert H. Keyser (1961) Ph.D.
Registered Professional Engineer, Associate Professor of Civil Engineering

Norman G. Kulgein (1963) Ph.D.
Lecturer in Mechanical Engineering

Tuck Hop Lee (1961) Ph.D.
Lecturer in Electrical Engineering

Gerald E. Markle (1963) Ph.D.
Professor of Engineering & Director Computer Center

Henry A. McKenna (1960) B.M.E.
Registered Professional Engineer, Instructor in Mechanical Engineering

George M. Miller (1964) M.S.
Lecturer in Electrical Engineering

Robert Ian Murray (1951) M.S.
Registered Professional Engineer, Assistant Professor of Mechanical Engineering

Henry P. Nettesheim (1947) M.S.
Registered Professional Engineer, Associate Professor of Electrical Engineering

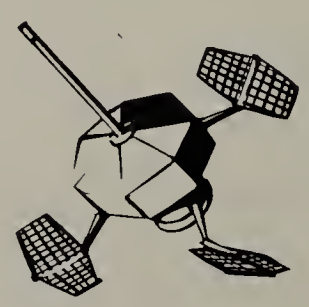
Joseph K. O'Keefe (1963) M.S.
Lecturer in Mechanical Engineering

Robert J. Parden (1954) Ph.D.
Registered Professional Engineer, Dean and Professor of Engineering

Richard K. Pefley (1951) M.E.
Registered Professional Engineer, Chairman and Associate Professor of Mechanical Engineering

FACULTY

Jack A. Peterson (1955) M.S.
Associate Professor of Electrical Engineering
Richard S. Rosler (1963) Ph.D.
Lecturer in Mechanical Engineering
Michel A. Saad (1959) Ph.D.
Registered Professional Engineer, Associate Professor of Mechanical Engineering
Paul O. Scheibe (1962) Ph.D.
Lecturer in Electrical Engineering
Stanley F. Schmidt (1962) Ph.D.
Lecturer in Electrical Engineering
Gail B. Shook (1962) Ph.D.
Lecturer in Mechanical Engineering
Dragoslav D. Siljak (1964) Sc.D.
Visiting Associate Professor of Electrical Engineering
Robert E. Smith (1962) M.S.
Lecturer in Civil Engineering
George L. Sullivan, Ph.D.
Registered Professional Engineer, Emeritus Dean and Professor of Engineering
Harold M. Tapay (1950) M.S.
Registered Professional Engineer, Associate Professor of Civil Engineering
George J. Thaler (1962) Ph.D.
Lecturer in Electrical Engineering
Robert C. Whitten (1964) Ph.D.
Lecturer in Physics
Colman B. Winn (1962) M.S.
Lecturer in Mathematics
Raymond B. Yarbrough (1963) Ph.D.
Assistant Professor of Electrical Engineering



V

THE UNIVERSITY OF SANTA CLARA

SCHOOL OF LAW

CATALOG · 1964-1965

SANTA CLARA · CALIFORNIA · 95053

SECTION V

SCHOOL OF LAW

BERGIN
HALL

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SCHOOL OF LAW

ADMINISTRATIVE OFFICERS

Patrick A. Donohoe, S.J., Ph.D. . . . . President
Alexis I. Mei, S.J., Ph.D. . . . . Academic Vice President
Leo A. Huard, A.B., LL.B. . . . . Dean
George A. Strong, M.A., LL.B. . . . . Assistant Dean
David P. Arata, B.S. . . . . Registrar

EDUCATIONAL POLICY, PURPOSE, AND SCOPE

The School of Law seeks to graduate lawyers who are competent and ethical. To this end, the curriculum is directed to a study of the processes by which the courts and other judicial bodies decide controversies and a study of the legal rules and principles which guide them.

The School of Law provides thorough training in the fundamental processes, principles, and reasonings of English and American law, with emphasis on modifications peculiar to California. It strives to develop in its students a high moral regard for the law that they may better appreciate the great contribution that the legal profession can make to society.

The general method of instruction followed is the case system in which the student is called upon to analyze and discuss selected cases from various jurisdictions. This system is often supplemented by lectures. A constant effort is made to challenge the student's mind as well as to guide him in his search for knowledge.

The administration and faculty of the School of Law believe that the most effective teaching frequently is not teaching in any formal sense. Intellect and moral character are not developed merely in formal class sessions. Therefore, the School of Law is committed to a policy of maintaining intimacy and contact between professor and student during classes and through the day. Full-time faculty members are available for consultation with students throughout the day.

PRELEGAL PREPARATION

Beyond the admission requirements detailed below, no specified prelegal course is demanded. However, the emphasis in legal education is upon development of the ability to analyze and synthesize, and to give clarity and conciseness to the expression of this ability. Hence, those undergraduate courses which advance this general development should be pursued.

Any subject may be taught and studied from an analytical point of view, including those of the fine arts, so that any sound program leading to an academic degree may be followed. There are certain subjects

which undoubtedly lend themselves more to this growth than others: philosophy, logic, mathematics, the physical, biological and social sciences, to name but a few.

Of great importance to the success of a student in law is the ability to express his learning in clear, concise terms. Once a problem is analyzed, all further steps require the ability to express his thoughts adequately in written and oral English. Therefore, it is recommended that prelegal students take three years of college English, emphasizing expository and argumentative compositions. All examinations in the School of Law and before the State Bar of California are written in essay form.

It is imperative that good study habits be developed. The prelaw student should seek to develop a planned, mature, self-scheduled, and self-disciplined program of study. Prelegal students capable of tackling, organizing, and successfully concluding a research problem on their own initiative will find the study of law stimulating and profitable.

LAW LIBRARY

The Edwin A. Heafey Law Library building is adjacent to the classroom and office building, Bergin Hall.

The law library is the lawyer's laboratory, and The Heafey Law Library is equipped and operated to advance this principle. The Law School administration constantly seeks to improve library facilities and the utility of the collection to students and faculty.

HONORS, AWARDS, AND PRIZES

Awards Convocation

Each spring, the Law School holds an Awards Convocation. The convocation is presided over by the Dean, and Law Faculty and students are present. The President or Academic Vice-President of the University awards prizes and certificates for outstanding performance at this time, as here detailed.

Certificates of Achievement

The senior editors and staff of the *Santa Clara Lawyer* receive engraved certificates.

The tutors who participate in the Student Bar Association sponsored tutorial program for first-year students receive similar awards.

Intramural Moot Court Competition

The winner of the Intramural Moot Court Competition held each year receives a similar certificate and also a book and a subscription to the law review of his choice.

Outstanding Graduate Designation

The outstanding graduate is designated at this time, being the graduating senior who best represents, in his class, the type of student the University of Santa Clara Law School is most proud to graduate, by reason of his demonstrated qualities of scholarship, community leadership, and sense of moral responsibility.

Awards for Community Leadership

Four Awards for Community Leadership in the form of engraved certificates are made to the four graduating seniors who have evidenced continuing cooperation with and service to the School of Law and the Student Bar Association.

The Chargin Prize

The Chargin Prize winner, being the student who has maintained the highest average for his three years in law school, is designated.

The Senior Prize

The Senior Prize is awarded to the student who achieved the highest academic average for his senior year.

Naming of Law Review Editors

At this convocation the editors and staff of the *Santa Clara Lawyer* for the succeeding year are named.

LAW REVIEW

The highest honor which the Law School offers to a student is the opportunity to participate in editing the *Santa Clara Lawyer*. Superior students are invited to compete for a position on the law review staff. The Dean and faculty issue invitations once each year. The *Lawyer* is a well-edited journal, available in most American law libraries. It is general in scope, but has tended to print articles in the fields of jurisprudence, public law, and on special aspects of California law, concentrating on proposed reforms.

The *Santa Clara Lawyer* traces its origin to the *Bergin Hall Review*,

a single issue of which appeared in 1951. The *Santa Clara Lawyer* was originally a law-record type of publication in tabloid form, several issues being printed each year from the 1940's to 1961. In that year, the Law Faculty elected to merge the functions of this intramural law periodical with emerging plans for a regular law review. In 1961 the *Santa Clara Lawyer* appeared in conventional form as a semiannual publication.

Students plan, organize, and edit the *Lawyer*, with the assistance of a faculty adviser. The editorial training, combining originality, resourcefulness, training in writing, research, and individual critical appraisal, is unmatched anywhere else in the University curriculum.

EDUCATION FOR PROFESSIONAL RESPONSIBILITY

Third-year students take part in a sequence specially prepared to prepare them for the difficult ethical and moral problems of daily practice. A series of readings, lectures, and addresses by distinguished judges and lawyers is followed by the legal aid work described below. The entire program is under the direction of a faculty member who has held positions of high honor in the California and federal legal profession.

LEGAL AID PROGRAM

Third-year Law students interview clients and prepare cases in this program. Under the direction of the Chief Counsel of Legal Aid and members of the Santa Clara County Bar, they assist in preparing forms, doing research, arranging for assistance of state and local agencies, and doing investigation.

The practical program is designed to give participants a taste of day-to-day practice, while it avoids carefully any unethical practice of law by nonlawyers. It develops a social consciousness and awareness of the problems faced by people of little or no income, those retired or impoverished by chronic illness. The office is in the Commercial Building in downtown San Jose, a large metropolitan center.

The Board of Directors of the Legal Aid Society of Santa Clara County directs the program. The board is made up of the Dean of this Law School, leaders of the county bar, and distinguished nonlawyers. The program is under the direction of a full-time attorney hired to supervise the activities of the students, and receives the cordial cooperation of the local bar and the Law Faculty. Participation is re-

quired of third-year students who spend twenty-eight hours during their third year in legal-aid work.

The Board of Directors each year chooses several students who have done work of an extraordinary character and presents them with the Legal Aid Society's Oustanding Service Award.

CAMPBELL LECTURES

The Campbell Lectures bring to the Law School each year four distinguished lecturers, who generally speak on subjects in which the lecturers have had great experience. The insight and familiarity with intricate fields of law which the speakers display, and the ability which they have to make the difficult seem simple, never fails to impress law students. Members of the public are invited, and first-year Law students are required to attend.

INSTITUTE OF CONTEMPORARY LAW

The Institute sponsors and supports studies of the legal problems which arise wherever municipal, state, and federal jurisdiction meet and interact. It carries on its work through special programs, publications, symposia, seminars, and lectures.

The staff of the Institute is the Law Faculty augmented by faculty members from other departments of the University when the needs of particular projects require. Students of the School of Law assist the faculty in Institute projects on an invitational basis.

EVENING DIVISION

Evening law instruction at this Law School was instituted in September 1962. The evening program runs four years and one summer session for the LL.B. degree. Faculty, courses, credits, and requirements are substantially the same as in the day division.

SUMMER SESSION

Summer session law courses are open to attorneys and to students who have satisfactorily completed their first or second year of law study.

Courses taken in the summer session may be credited toward the professional degree, but time so spent may not be counted as part of the required period of residence. Students may find it advantageous to take one or more courses offered in the summer so that they may elect advanced or specialized courses in the third or fourth year.

An applicant who submits proof of enrollment in good standing at a member school of the Association of American Law Schools may take courses for credit to be allowed by his parent school. Information concerning the summer session may be obtained by writing to the Office of the Dean.

SCHOLARSHIPS AND LOANS

Scholarships are available to those who demonstrate unusual potential for the study of law. These scholarships are distributed among students in all three classes of the School of Law, and a fair proportion is designated for first-year students.

In awarding scholarships, the faculty considers need as well as undergraduate and law school scholastic achievement. Generally, scholarships are continued in the same or diminished sums so long as the student maintains a superior level of performance in his law studies. Applications for scholarships should be addressed to the Dean and should be renewed each year.

Law students may qualify for loans on the same basis as other students at the University. See the general statement above.

STUDENT EMPLOYMENT

Law study is hard, full-time work. A day student who works more than a nominal ten or fifteen hours per week, including time spent in going to and from work, will find his grades adversely affected. The law program is predicated on the fact that day students hold no outside employment and night students hold ordinary employment.

It is recommended that no day student hold employment for more than fifteen hours a week. Studies have shown that day students employed twenty-five or more hours a week while pursuing a full-time law program, almost invariably find their grades marginal or deficient.

This Law School is sympathetic to the student with limited funds, but its programs are in no way varied to accommodate the working student. Those who find it necessary to work more than a limited

and nominal number of hours a week should enroll in the evening program. Even in the evening program, students should seek ways of shortening the number of hours devoted to the job or lightening the work load.

Certain types of employment have a minimal adverse effect, and students who must work part time are urged to consider seeking employment in the Law Library, with local law firms, and the like.

HOUSING

At the present time, there is no housing available on campus for law students.

STUDENT BAR ASSOCIATION ACTIVITIES

Organization

The Student Bar Association is the student governing body of the School of Law. Membership is open to all students in the School. The Student Bar Association is a charter member of the American Law Students Association sponsored by the American Bar Association. The Association seeks to promote among the law students a consciousness of professional responsibility and to provide a medium for the regulation of student activities generally.

Honor System

Lawyers are charged with preserving the social and moral code of civilized society. It follows necessarily from this consideration as well as from the moral philosophy of this Law School that the highest standard to which our law students can be held is that which they form for themselves.

The Student Bar Association is charged with the preservation and administration of the student code of honor, and each student is the censor of his own conduct and that of his fellow students. Law examinations are not proctored by administration or faculty. The code extends as well to the submission of papers and to the everyday affairs of student life. Honor and discipline are the hallmarks of the Santa Clara Law student.

Tutor Program

Entering students are assigned to tutors who advise and assist in every way possible in the transition from undergraduate work. As fellow

students, the tutors give the sort of informal picture of law study which is beyond the power of the law faculty to convey. Besides this opportunity for consultation and information, the tutors attempt to advise on methods of study and preparation for class and for examinations.

Early in the year, the tutors, with the assistance of faculty members, prepare, administer, and critique written law-school-type examinations. Examination preparation and writing techniques are suggested by the program, and no grade is, or can be, assigned to papers submitted in the tutor examinations. The program is entirely voluntary.

Tutors are outstanding upper-class Law students who participate voluntarily and without compensation in this attempt to bridge the Law School generations and to ease the way for the beginner. The program is sponsored by the Student Bar Association and is under the general direction of a faculty adviser.

Moot Court

The glamor and majesty of the law touch the law student for the first time when he is assigned to argue a case on appeal before a critical bench. Everything else has been prelude, and this is what a lawyer really does. The weeks of research and brief writing are past and the argument is at hand. Probably no part of law training appeals to the average law student more strongly than the appellate moot court program.

Second-year day and third-year evening students take part in moot court pleading under the direction of a student committee. The committee selects the problem, prepares the record, assigns counsel, and directs the activities. The judges who give their time voluntarily and without recompense are active lawyers, judges, and law professors. The student committee works under the general supervision of a faculty member.

Saint Thomas More Society

In the spirit of the great lawyer and chancellor, the Catholic students of the law school have formed this society, an affiliate of the national organization, to do him honor and to further his conviction that death was preferable to compromising or relinquishing his innermost convictions.

The society meets occasionally and sponsors two or three Communion breakfasts on Sundays during the school year. The breakfasts feature addresses by distinguished judges and lawyers. The chairman of the group is named by the Student Bar Association.

ADMISSION

Admission to First-Year Day and Evening

Admission to the School of Law is on a selective basis. The Committee on Admissions will consider carefully the qualifications of each applicant as to character, intellectual ability, the prospect for success in law studies, and professional promise.

Applicants for admission to the professional curriculum of the School of Law, leading to the degree of Bachelor of Laws, must have completed at least three years of undergraduate study toward a baccalaureate degree in a university or college of approved standing. The applicant must have earned at least 90 semester or 135 quarter-units of credit. Courses without intellectual content of substantial value are not acceptable in computing the required units of credit.

The applicant must submit with his application at least two letters of recommendation as to his character and integrity. Whenever possible, the references should include a member of the Bar and a former professor.

The applicant must submit a satisfactory score on the Law School Admission Test. The test is given four times a year at examination centers conveniently located throughout the United States. The test is given at the University of Santa Clara School of Law.

No special preparation is suggested, since the test is designed to measure legal aptitude, ability, writing skill, and general background rather than knowledge of subject matter. Test score is only one of the factors considered in passing on admission to the Law School. Forms and information may be obtained from the Office of the Dean, University of Santa Clara School of Law, or directly from the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

No firm standards for admission beyond those stated above can be set forth. The variation in the nature and quality of undergraduate preparation and differences in the standards of various colleges make it difficult, if not impossible, to predict the decision of the admissions committee in a particular case.

Applicants will be accepted on the basis of their presumptive fitness to pursue the study of law with success as indicated by their college records, Law School Admission Test score, information as to character and fitness contained in the application forms and letters of recommendation, as well as by other data available or required. The Committee on Admissions places some emphasis on the work done in the last two years of undergraduate study. The Committee may require that an applicant appear for an interview.

The School of Law is open to men and to women of good character. No discrimination is made on the ground of race or religious belief.

Students beginning their professional work are admitted only in September.

Admission to Advanced Standing

Applicants who have completed one year of study in a law school approved by the American Bar Association and a member of the Association of American Law Schools may be considered for admission to advanced standing with credit for not more than one year of study. The applicant's undergraduate record must be such that he would have been permitted to enter the School of Law as a first-year student. The work for which credit is sought must have been of superior quality.

The Committee on Admissions will evaluate the applicant's record and determine the credit to be allowed toward graduation. The applicant must be eligible for readmission to the law school previously attended. No student will be admitted to advanced standing as a special student. The student who is admitted to advanced standing must complete his last two academic years in residence in the School of Law, if a day student, or last three academic years in the evening division.

Combined Program

Students in the College of Arts and Sciences or in the School of Business of the University of Santa Clara may enter into a course of study, the successful completion of which will enable them to apply credits from the first year of the School of Law toward the requirements for the appropriate Bachelor's degree.

The combined program enables the student to obtain both undergraduate and Bachelor of Laws degrees in six years. The program is open only to day students. Students interested in the combined program should consult with their deans concerning the terms and conditions of the program.

Military Science

Candidates for a law degree who qualify for and are selected for the Advanced Course in Military Science may be commissioned on completion of the advanced program. They may be excused from reporting for active duty for a maximum period of three years, to obtain a Bachelor of Laws degree and to take the bar examination given next after graduation in the state of their choice.

Auditors

Attorneys and judges may enroll as auditors in specific subjects in the fields of their professional interests. Auditors pay the prescribed auditor's fee but take no examinations and receive no academic credit for work completed.

Admission Procedure, Day and Evening Divisions

The applicant must:

1. File the required form with the Registrar.
2. Take the Law School Admission Test.
3. Send official transcripts of all courses taken at every institution of higher learning attended. Information as to courses in which applicant is presently enrolled must be furnished.
4. Deposit $100 with the Registrar when he is notified that he has been accepted. This money will be applied as a deposit on tuition and fees. Information as to registration will be sent automatically thereafter.

STUDENT EXPENSES

Application Fee	$ 5.00
This charge is to be sent with each application form and is not refundable.	
Tuition per Quarter: (1964-65)	
Day Division	367.00
Evening Division	267.00
Incidental Fee per Quarter: (1964-65)	
Day Division	33.00
Evening Division	5.00
Late Submission of Administrative Forms per Day	2.00
Additional copies of Student's Transcript of Grades	1. ea.
Graduation	25.00
Fee for each change in schedule of course	2.00

STUDENT REGISTRATION FOR STATE BAR EXAMINATIONS

Most state bar associations have promulgated rules which must be complied with before a student is eligible to take the local bar examination. In some states, including California, the student is required to register with the bar examiners at the time he begins his study of law. Other common requirements pertain to acceleration, required courses, minimum course load, and similar matters. In order to assure himself of the opportunity to take the bar examination of his choice upon graduation, the student should familiarize himself with the rules that obtain in that state. Write to the bar examiners of the state in which you wish to practice. The Dean's office has information available and will render assistance. Compliance is solely the student's obligation, and early investigation of this matter is of great importance.

ADMINISTRATION AND SUPERVISION

Attendance

The School of Law requires punctual and regular attendance of students at all classes. A professor may assess penalties in his sole discretion for tardiness or absence. Any student who has been absent from class during any term more than twice the number of times that class meets per week is disqualified from that course and will receive a failing grade in the subject: e.g., for a 2 quarter-hour class, four absences; for 3 hours, six absences. In his sole discretion, a professor may assign seats, call the class roll, or take other steps to expedite enforcement of this rule.

Examinations

Written final examinations are required at the end of each course. Examinations are conducted under a number system in which students remain anonymous to the grader. Additional examinations may be scheduled at the option of the faculty. If a student is unable to take an examination at the time scheduled, several days prior to the time of the examination he must notify the Office of the Dean, in writing, of his anticipated absence and the reason therefor. If the excuse is not acceptable, or if the student fails to give prompt notice, a grade of F will be recorded. If the excuse is acceptable and the notice timely, the student may be permitted to take a deferred examination at the discretion of the faculty. A deferred examination fee of $15 must be attached to the petition to take the examination. Ordinarily, re-examination, when permitted, will be at the next date an examination in the course is regularly given.

Grading

The grade earned in each course is recorded by alphabetical designation as shown below:

A = 4.00; B+ = 3.80; B = 3.40; B– = 3.00; C+ = 2.80; C = 2.40; C– = 2.00; D+ = 1.80; D = 1.40; D– = 1.00; F = 0.00.

A denotes outstanding scholarship; the B range indicates superior work; the C range is satisfactory; and the D range describes unsatisfactory, but passing, work sufficient for residence credit only. F is failing work, unsatisfactory for both scholastic and residence credit. A student's academic standing is determined by his grade-point average (G.P.A.), which is ascertained by dividing the number of grade points scored in accordance with the above norms (e.g., A = 4; B = 3.4; C+ = 2.8, etc.) by the number of units of work completed.

Grading Standards

A student who has a G.P.A. of less than 2.2 at the end of his first year will be dismissed for poor scholarship.

A student must have a cumulative G.P.A. of 2.2, or better, in order to be admitted to the third-year day and third- and fourth-year evening division.

A student must maintain a cumulative G.P.A. of 2.2, or better, in order to graduate.

No student shall register for any summer session if his cumulative G.P.A. is less than 2.2.

At the end of the first year and at the end of every term thereafter, the student must achieve and maintain a cumulative G.P.A. of 2.2 for all courses completed and end-of-quarter final examinations taken.

Except for the first three quarters of attendance, in calculating a student's cumulative G.P.A. for continuance in satisfactory standing, grades received at the end of a term shall be counted as final grades. No student who maintains an average of less than 2.2 G.P.A. at the end of any term shall continue in attendance, except by faculty consent given by majority vote at a regular meeting.

Disqualification

If, in the opinion of the faculty, a student's work is so poor as to justify the action, or if it is reasonably certain that he does not possess the qualifications necessary for success in the legal profession, he may be barred from further attendance.

No student who has been disqualified from further attendance may reexamine in or retake any course without the consent of the faculty given by majority vote at a regular meeting. Where such consent is given, the student may retake or reexamine in the course, subject to such limitations and conditions as the faculty may prescribe. Such readmission is an extraordinary procedure, and the status of the student and his continuance in the curriculum shall be governed thereafter solely by the limitations and conditions then or thereafter prescribed by the faculty. Ordinarily, re-examination, when permitted, will be at the next date an examination in the course is regularly given.

Withdrawal from Courses

No student shall withdraw from a course after completion of the fourth week of the first term of the particular course sequence without consent of the Dean and the professor teaching the course. A student who so withdraws shall receive the grade of W/F for the course. The

faculty by majority vote at a regular meeting may permit him to withdraw with the grade of W.

Failure in Required Courses

No student who receives a grade of F for a required course, as indicated by an asterisk in the program of courses, will be graduated unless he retakes and completes the course with a passing grade (D– or better). The student shall reregister for the course by appending the letter R to the number indicating the quarter units, e.g., 3R. Credit shall be given only once, when the course is passed the first time. The student's academic record shall be charged with units attempted each time the course is repeated.

No student may reexamine without retaking the course except by faculty consent by majority vote at a regular meeting. Consent to reexamine will be given only for the most compelling reasons – for example, death in the immediate family, military service requirements, serious physical or mental ill health duly certified. Consent to reexamine will not be given for less serious reasons – for example, poor preparation, poor examination writing technique, lack of time to study, marriage, minor or transitory illness, failure to understand the nature or content of the examination. Ordinarily, re-examination, when permitted, will be at the next date an examination in the course is regularly given.

Discipline

Students must observe the general disciplinary regulations of the University of Santa Clara, as well as the special rules of the Law School as they now exist or as they may be promulgated from time to time.

Rights Reserved

The University and the Law School reserve the right to advance the requirements for admission or graduation; modify the arrangement, content, or materials of courses; change tuition fees, class and examination schedules and any regulations affecting the student body. Such changes shall become effective whenever the administration shall determine and may operate retroactively.

The administration also reserves the right to terminate or restrict the attendance of any student at any time, or to remove from the list of candidates for a degree the name of any student should it be in the interest of the University.

Those who do not wish to accept these conditions should not apply for admission or remain in attendance.

Graduation Requirements

In order to graduate with the LL.B. degree, the student must have:

1. Received credit for at least 126 quarter units of law.
2. Obtained a cumulative grade-point average of 2.2 for his entire law school work.
3. Fulfilled the requirements of residence for three academic years in the day division in either this Law School or some other approved law school, the last two academic years of which, in any event, must have been spent in residence at this Law School. Students in the evening division must fulfill residence requirements for four academic years and must spend the last three years in residence at this Law School.

No student in the Law School is permitted to take the California bar examination before he has completed successfully the course of study prescribed for the LL.B. degree, and until successful completion has been certified by the Dean of the Law School. Immediate expulsion will follow violation of this requirement.

Graduation Honors

A candidate for the Bachelor of Laws degree who has a grade-point average of 3.00 to 3.24 graduates Cum Laude; one who has a grade-point average of 3.25 to 3.49, Magna Cum Laude; and 3.50 and over, Summa Cum Laude.

PROFESSIONAL COURSES

Numbers after course names indicate quarter units.

First Year

101. LEGAL RESEARCH AND WRITING* (3)

Nature and use of law books, including practical problems in the use of reports, statutes, encyclopedias, digests, periodicals, citation books.

102. CONTRACTS* (9)

The formation of contracts, offer and acceptance, consideration, joint and several contracts, third-party beneficiary contracts, assignment, statute of frauds, excuses for nonperformance, damages, remedies.

* Passing grade required.

103. TORTS* (9)

Liability and defenses for intentional and negligent injury to persons and property, liability without fault, causation, nuisance, survival and wrongful death, misrepresentation, defamation, right of privacy, malicious prosecution.

104. PROPERTY I* (10)

Personal and real property. Possession, finding, bailment, adverse possession, bona fide purchase, deeds, estates, recording, landlord and tenant, covenants, easements, licenses, waste, equitable servitudes, fixtures.

106. CRIMES* (4)

Substantive law of specific crimes and the nature of the criminal act.

107. AGENCY (2)

Principal and agent, undisclosed principal, ratification, respondeat superior, accounting, scope of employment, workmen's compensation, express, implied and apparent authority, liability to third parties, termination of status.

111. EQUITY* (6)

Origin and nature of equity jurisdiction, specific performance of contracts, equitable relief.

114. PLEADING AND CIVIL PROCEDURE* (6)

Jurisdiction, forms of action, pleading, civil procedure, historical development and modern practice.

Upper Class Courses

201. EVIDENCE* (9)

Civil and criminal evidence with particular reference to federal and California rules, problem of proof, judicial notice, real proof, testimonial proof, circumstantial proof, procedural considerations, hearsay, and exclusionary rules.

202. BUSINESS ORGANIZATIONS* (9)

Corporations, partnerships, joint ventures, sole proprietorship. Problems of formation, management, control, capitalization, dividends, reorganization, dissolution.

* Passing grade required.

203. WILLS AND ESTATES* (3)

Intestate succession and testamentary capacity, execution of formal and holographic wills, revocation and revival, pretermitted heir and lapsed gifts, ademption, advancements, increase and exoneration.

204. PROPERTY II* (3)

Shelley's Case, Worthier Title, rights of entry and possibilities of reverter, remainders and executory interests, construction, rule against perpetuities, powers of appointment.

206. TRUSTS* (4)

Nature and creation, express, charitable, spendthrift and business trusts; resulting and constructive trusts, administration and termination, rights and duties of trustee and other parties.

209. MOOT COURT

Preparation and presentation of a case before an appellate tribunal, including written briefs and oral argument.

212. COMMERCIAL TRANSACTIONS* (6)

Transfer of title to personal property, documents of title, conditional sales, risk of loss, warranties, statute of frauds, liability for defects of title, and remedies of buyer and seller.

301. COMMUNITY PROPERTY* (4)

Marital community, property interests as separate or community, management and control, liability for debts, dissolution of the community.

303. CALIFORNIA PROCEDURE* (6)

Action under the Code, parties, complaint, demurrer, answer, cross-complaint and reply, demurrers to pleadings subsequent to complaint.

304. CONFLICT OF LAWS* (4)

Sources and development of private international law, jurisdiction of courts and foreign judgments, conflict of laws with respect to procedure, wrongs, contracts, property, business organizations, and administration of estates.

305. CONSTITUTIONAL LAW* (8)

Judicial review, immunities of federal and state governments, federal delegated powers and reserved state powers, federal

* Passing grade required.

powers as limitations on state powers, individual rights as limiting federal and state powers.

306. THE LEGAL PROFESSION (1)

Legal ethics and professional standards, the lawyer's responsibility to client, profession, and public. Students required to participate in legal aid work.

308. FEDERAL INCOME TAX* (4)

Problems of the business and nonbusiness taxpayer, capital gains and losses, corporations and shareholders, partners and partnerships, tax practice and procedure, accounting and income taxation.

309. FEDERAL ESTATE AND GIFT TAX* (3)

Taxation of lifetime and testamentary transfers, including tax problems in estate planning.

Electives†

403. LABOR LAW (3)

The labor movement, common law of labor, union organization, recognition, collective bargaining, wages and hours, strikes and picketing, anti-injunction and antitrust laws.

404. FAMILY LAW (3)

Marriage, annulment, divorce, separation, alimony, support and property settlements, intrafamilial rights and and obligations, guardianship, legitimation, adoption, child custody, Juvenile Court Law.

405. SECURITY TRANSACTIONS (3)

Mortgages, deeds of trust, pledges, liens, chattel mortgages, conditional sales and trust receipts, rights of redemption, discharge, subrogation and exoneration.

406. LOCAL GOVERNMENT LAW (3)

Legislative process in municipalities, districts and counties, duties and responsibilities of public officers and boards, zoning, subdivision, annexation, building regulations.

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* Passing grade required.

† Some electives are offered only in alternate years. Other electives than those listed are often scheduled, depending on the availability of faculty and on student interest in a particular area.

407. TRADE REGULATION (3)

Contracts and combinations in restraint of trade, unfair competition, antitrust laws and regulation of methods of competition, governmental regulation of misrepresentation and pricing practices.

410. ADMINISTRATIVE LAW (3)

Powers of and procedures before administrative tribunals, executive, legislative, and judicial control of the administrative process, exhaustion of remedies, appeal, federal and state administrative procedure acts.

417. LEGISLATION (3)

Legislative power, organization and operation of legislative bodies, legislative process, interpretation of statutes, drafting and enforcement of legislation.

418. CREDITOR'S RIGHTS (4)

Bankruptcy, insolvency, receivership, debtor's choice of remedies, petitions, claims and dividends of creditors, exemptions.

419. GOVERNMENT CONTRACT LAW (3)

Legal aspects of U.S. government contracts and subcontracts, differences from standard commercial contracts, review of applicable laws and regulations, discussion of relevant court and administrative decisions.

420. INTERNATIONAL LAW (3)

Public international law and related problems of U.S. law, emphasizing subjects of interest to practicing lawyers, examination of selected international organizations, UN, NATO, European Communities, etc.

430. LEGAL ACCOUNTING (3)

Study of basic accounting principles and their application to law. Not open to students with a substantial accounting background.

431. RESTITUTION (3)

Quasi contract and equitable remedies for the recovery of benefits conferred, as a means of preventing unjust enrichment, including constructive trusts, subrogation, contribution, equitable liens.

432. INSURANCE (3)

Formation of insurance contracts, coverage, risks, indemnity, subrogation, coinsurance.

MEMBERSHIPS AND ACCREDITATIONS

Approved by the American Bar Association
Member Association of American Law Schools
Accredited by the State Bar of California
Member of Western Conference of Law Schools

LOCATION

The University of Santa Clara is 46 miles from San Francisco near the southern tip of the Bay. Railroad and bus and car transportation by freeway places the renowned cultural and entertainment centers of San Francisco, Berkeley, Oakland, and Marin County within one hour's travel. In the opposite direction are the beaches of Santa Cruz and less than two-hours drive from the campus is the world-famed Monterey Peninsula and Carmel.

The University is accessible by all major railroads, by major airlines via San Francisco International Airport, and by United Airlines and Pacific Airlines at San Jose Airport – about three miles from the campus.

THE CAMPUS

Santa Clara's campus has grown almost as dramatically as its enrollment. An increasing number of its new buildings are being placed across El Camino Real (or "King's Highway") opposite the original campus. Forty-eight buildings cover its sixty-seven acres and, despite the historic traditions of the buildings and the blending of early Spanish Colonial architecture with modern convenience and utility, the campus has lost none of the serenity or charm with which it was originally endowed well over a century ago. The well-kept lawns and lush gardens reflect the richness of the soil and the temperate climate of the Santa Clara Valley, which was once called the "Garden of the World." The campus is set with immense redwoods, includes spruces, sycamores, and olive trees, and is lined with tall date palms.

FACULTY

William A. Antonioli (1960)
Lecturer in Law
A.B., 1950, LL.B., 1953, University of Santa Clara.

James L. Blawie (1960)
Professor of Law
B.A., 1950, University of Connecticut; A.M., 1951, Boston University; J.D., 1955, University of Chicago; Ph.D., 1959, Boston University.

John E. Cavanagh (1961)
Lecturer in Law
A.B., 1941, University of Oregon; J.D., 1949, LL.M., 1952, George Washington University.

Daniel R. Cowans (1959)
Associate Professor of Law
A.B., 1943, LL.B., 1950, University of California.

Henry A. Dietz (1962)
Professor of Law
B.S., 1929, University of Oregon; LL.B., 1933, University of California.

Graham Douthwaite (1959)
Associate Professor of Law
B.A., 1933, LL.B., 1936, University of Witwatersrand; B.C.L., 1940, Oxford University.

Mary B. Emery (1963)
Assistant Professor of Law; Acting Law Librarian
B.A., 1960, San Jose State College; LL.B., 1963, University of Santa Clara.

Haskell M. Goodman (1960)
Lecturer in Law
B.S., 1945, LL.B., 1947, Harvard University.

Aidan R. Gough (1961)
Assistant Professor of Law
A.B., 1956, A.M., 1957, Stanford University; LL.B., 1962, University of Santa Clara.

FACULTY

LEO A. HUARD (1959)
Professor of Law; Dean, School of Law
A.B., 1939, St. Anselm College; LL.B., 1946, Georgetown University.

JERRY A. KASNER (1961)
Assistant Professor of Law
B.S., 1955, J.D., 1957, Drake University.

CYRIL R. KAVANAGH, S.J. (1962)
Counselor
A.B., 1921, A.M., 1922, Gonzaga University; S.T.L., 1930, Colegio de San Ignacio, Sarria, Barcelona, Spain.

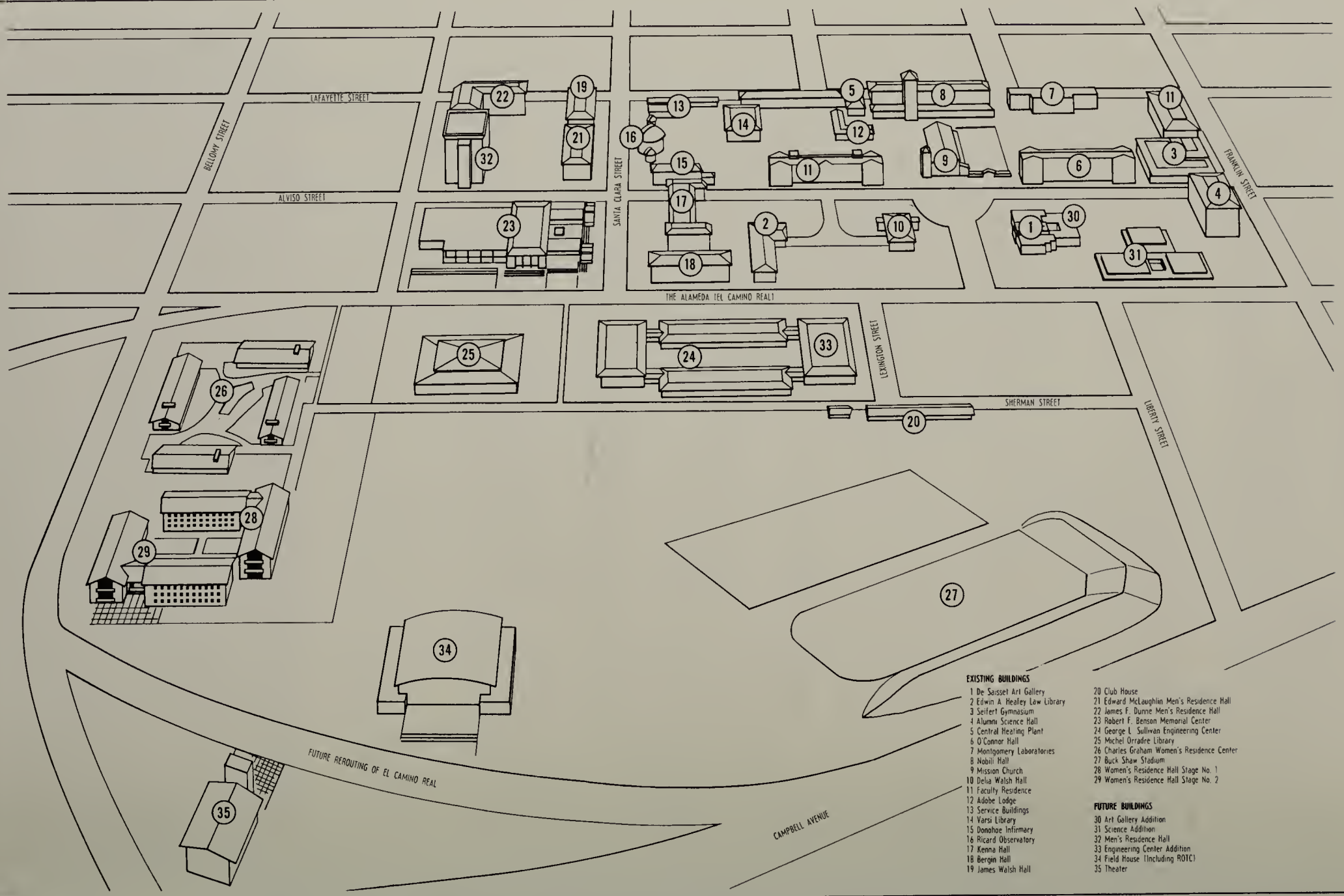
EDWIN J. OWENS (1934)
Professor of Law
A.B., 1919, Holy Cross College; LL.B., 1922, Harvard University; LL.D., 1952, University of Santa Clara.

SAMUEL F. PEARCE (1961)
Lecturer in Law
A.B., 1952, LL.B., 1955, University of Washington.

JOHN M. RAYMOND (1961)
Lecturer in Law
A.B., 1916, Princeton University; LL.B., 1921, Harvard University.

GEORGE A. STRONG (1955)
Professor of Law; Assistant Dean, School of Law
B.S., 1944, University of Notre Dame; A.M., 1952, University of California; LL.B., 1955, University of Santa Clara.

AUSTEN D. WARBURTON (1946)
Lecturer in Law
A.B., 1938, San Jose State College; LL.B., 1941, University of Santa Clara.


LAFAYETTE STREET
ALVISO STREET
BELLOMY STREET
SANTA CLARA STREET
THE ALAMEDA (EL CAMINO REAL)
LEXINGTON STREET
SHERMAN STREET
LIBERTY STREET
FRANKLIN STREET
FUTURE REROUTING OF EL CAMINO REAL
CAMPBELL AVENUE
EXISTING BUILDINGS
1 De Saisset Art Gallery
2 Edwin A. Healey Law Library
3 Seifert Gymnasium
4 Alumni Science Hall
5 Central Heating Plant
6 O'Connor Hall
7 Montgomery Laboratories
8 Nobili Hall
9 Mission Church
10 Delia Walsh Hall
11 Faculty Residence
12 Adobe Lodge
13 Service Buildings
14 Varsi Library
15 Donohoe Infirmary
16 Ricard Observatory
17 Kenna Hall
18 Bergin Hall
19 James Walsh Hall
20 Club House
21 Edward McLaughlin Men's Residence Hall
22 James F. Dunne Men's Residence Hall
23 Robert F. Benson Memorial Center
24 George L. Sullivan Engineering Center
25 Michel Orradre Library
26 Charles Graham Women's Residence Center
27 Buck Shaw Stadium
28 Women's Residence Hall Stage No. 1
29 Women's Residence Hall Stage No. 2
FUTURE BUILDINGS
30 Art Gallery Addition
31 Science Addition
32 Men's Residence Hall
33 Engineering Center Addition
34 Field House (Including ROTC)
35 Theater

VI

ALMA COLLEGE

SCHOOL OF SACRED THEOLOGY

CATALOG · 1964-1965

LOS GATOS · CALIFORNIA · 95030

SECTION VI

SCHOOL OF SACRED THEOLOGY

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SCHOOL OF SACRED THEOLOGY

BOARD OF TRUSTEES OF ALMA COLLEGE

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President

William J. Keenan, S.J.
Francis L. Sheerin, S.J.
Harry T. Corcoran, S.J.
Robert H. Dailey, S.J.

Alma College of Los Gatos, California, was affiliated with the University of Santa Clara as its School of Sacred Theology in 1957. On October 23, 1934, Alma College was formally incorporated by an act of the State of California with the power to grant academic degrees. The Holy See, on August 22, 1945, granted the College the status of a Pontifical Faculty of Theology and gave the power to grant canonical degrees, including the doctorate, retroactive to the date of the College's inception. Registration is at present limited to members of the Society of Jesus in preparation for the priesthood.

HISTORY

Alma College is situated off California State Highway 17 about three miles south of Los Gatos. In the 1880's the property was known as the Knowles Ranch, having been purchased by Captain Knowles of San Francisco vigilante fame. In July, 1894 the land was sold to James L. Flood, son of the "Bonanza King." Mr. Flood spent some $250,000 on the property before it passed in 1906 to Dr. Harry L. Tevis. The earthquake of 1906 severely damaged the Flood mansion and Dr. Tevis rebuilt completely. His new home was completed in 1909. He lived periodically at Alma from that date until his death in 1931. On April 28, 1934 the Tevis estate was purchased by the California Province of the Society of Jesus for a School of Sacred Theology. Alma College opened its first classes on September 10, 1934, under the heavenly patronage of St. Joseph. On October 20, 1934 His Excellency the Most Reverend Edward J. Hanna, D.D., Archbishop of San Francisco, dedicated the property to the service of God. In the course of the thirty years of its existence, 760 Jesuit students of Alma College have been ordained to the priesthood.

PURPOSE AND OBJECTIVES

The School of Sacred Theology is a postgraduate, professional school with a four-year curriculum. It has a threefold purpose: First, to give the students a formation in the sacred and allied disciplines; second, to educate them in the knowledge of source material, the practice of scholarly work and investigation, and the exercise of the art of teaching;

third, to cultivate and advance knowledge in the field of sacred sciences.

Toward the attainment of these goals, the School of Sacred Theology defines its specific academic and professional objectives as follows: Main objective, the acquisition of that degree of theological formation necessary for the future activity of its graduates, whose interests are inevitably wide and varied — hence the acquisition of a body of doctrine derived from theological sources and method, and a knowledge of theological sources, methods, and techniques. Concomitant and correlative objectives are to make theology a vital influence in the lives of students, to render theology the continuation and the crown of the liberal education previously received, to impart the skills and techniques necessary in the priestly ministry (e.g., liturgical action, sacred eloquence, pastoral guidance), and to develop a recognition of the relevance of theology to the needs and concerns of man today.

LIBRARY

The library of the School of Sacred Theology is located on the Alma College campus, in its own building of modern design, completed in 1950, with a capacity of 110,000 volumes.

The book collection presently numbers approximately 61,000 volumes, primarily in the fields of historical and current theology and in collateral subjects as befits a professional library. The collection is particularly strong in biblical, patristic, conciliar, and papal documents and in the works of major dogmatic and moral theologians, in biblical commentaries, in canon law, and in modern theological journals (approximately 450 currently received).

The library makes readily available to faculty and students all the scholarly materials needed for research and instruction leading to licentiate and doctoral degrees in theological science according to Pontifical standards.

Furthermore, the collections of other theological libraries in the Bay Area are available, by cooperative agreement, for any desired materials not found in this library.

The library is equipped with a photostat camera, with microfilm reading apparatus, and with abundant carrels for private use.

ADMISSION

Only students who have attained a Master's degree, or its equivalent, in Philosophy are admitted to courses leading to the Master (Licentiate) of Sacred Theology (S.T.M.). A Bachelor's degree in Philosophy is required for admission to the courses leading to the degree of Master of Arts in Theology (M.A.Th.) and the degree of Bachelor of Sacred Theology (S.T.B.).

CURRICULA

There are two main curricula, one a four-year curriculum leading to the Bachelor of Sacred Theology degree and to the Master of Arts in Theology degree upon the fulfillment of certain further requirements, the other a four-year curriculum leading to the Master of Sacred Theology degree (Licentiate).

The difference between these programs is outlined in the Statuta Facultatum Theologiae et Philosophiae (1934) of the Society of Jesus, and its Ratio Studiorum (1954) and in the Apostolic Constitution, Deus Scientiarum Dominus (1931). In general, although both curricula present theology as an academic discipline on the graduate level, the curriculum leading to the Master of Sacred Theology degree gives greater emphasis to depth and research in theology, especially in the field of dogmatic theology, and, as such, is a more immediate preparation for theological studies on the doctoral level. The curriculum leading to the Bachelor of Sacred Theology and the Master of Arts in Theology, although it also emphasizes dogmatic theology, has in mind rather the attainment of a graduate-level understanding of theology that this in turn may be effectually communicated.

The division of subjects in the two curricula are as follows:

1. *Principal Disciplines.* Subjects essentially required for the accomplishment of the aims: Fundamental and Dogmatic Theology; Moral and Pastoral Theology; Sacred Scripture; Canon Law; Ecclesiastical History; Patrology and Christian Archeology; Liturgy and its History.

2. *Auxiliary Disciplines.* Subjects necessary for a proper treatment of the principal disciplines: Introduction to Old Testament; Introduction to New Testament; Biblical Greek; Biblical Hebrew; Oriental Theology; Ascetical Theology.

3. *Special Disciplines.* Complementary courses leading to a more thorough understanding of certain of the principal and auxiliary courses or to certain skills: Sacred Eloquence; Ecclesiastical Rites; various elective courses, such as advanced work in the biblical languages.

Students for the Master of Sacred Theology degree and for the Master of Arts degree must take the seminars required in their programs.

Students for the Master of Sacred Theology degree are required to take the courses in Biblical Greek and Biblical Hebrew. These are optional for the students for the Bachelor of Sacred Theology degree and the Master of Arts degree.

DEGREE PROGRAMS

Bachelor of Sacred Theology (S.T.B.)

This degree is awarded to students who have successfully passed all

the prescribed courses in the four-year program and who, in the field of fundamental and dogmatic theology, have an over-all average of B minus (2.75) in the annual oral examinations and in the forty-five minute final comprehensive oral examination.

Master of Arts in Theology (M.A. Th.)

This degree is awarded to students who, besides fulfilling the requirements of the Bachelor of Sacred Theology degree, have a 2.75 grade-point average in all courses taken during the four-year program, have a B average (3.0) in 34 specified units in courses selected out of the principal disciplines, have fulfilled the seminar requirements for the Master of Arts degree, and have received a B in the forty-five minute comprehensive oral examination in fundamental and dogmatic theology.

Master of Sacred Theology (S.T.M.)

This degree is awarded to students who have successfully shown the superior excellence required for this four-year program, including a three-hour written examination in one of the principal disciplines and an eighty-minute comprehensive oral examination in fundamental and dogmatic theology.

Canonical Degrees

In addition to these degrees granted by the University of Santa Clara to which Alma College is affiliated as the University's School of Sacred Theology, Alma College also grants in its own name as a canonically established Faculty of Theology in the Roman Catholic Church the canonical degrees of Bachelor of Sacred Theology (S.T.B.) and Licentiate of Sacred Theology (S.T.L.).

THEOLOGY COURSES

The unit value of each course is indicated in *semester* units in parentheses immediately after the title.

Courses listed "Second, Third, and Fourth Years" are taught every third year. Courses listed "First and Second Years" or "Second and Third Years" or "First and Third Years" are taught in alternate years.

A. Principal Disciplines

FUNDAMENTAL THEOLOGY

201. REVELATION (3)

A more concentrated and selective treatment of the contents of course 301. First Year.

202. INTRODUCTION TO GOSPELS AND ACTS OF THE APOSTLES (2)

A more concentrated and selective treatment of the contents of course 302. First Year.

203. BIBLICAL INSPIRATION (1)

A more concentrated and selective treatment of the contents of course 303. First Year.

204. ACT OF FAITH (2)

A more concentrated and selective treatment of the contents of course 304. First Year.

205. THE FOUNDING OF THE CHURCH (4)

A more concentrated and selective treatment of the contents of course 305. First Year.

206. TRADITION AND MAGISTERIUM (2)

A more concentrated and selective treatment of the contents of course 306. First Year.

207. THE NATURE AND MISSION OF THE CHURCH (2)

A more concentrated and selective treatment of the contents of course 307. First Year.

301. REVELATION (3)

Critical examination of titles Messiah, Son of Man, Son of God in Synoptics, illustrating progressive revelation Jesus made of his identity; investigation of signs sealing his claims with divine approval. First Year.

302. INTRODUCTION TO GOSPELS AND ACTS OF THE APOSTLES (2)

Separate studies of Mark, Matthew, Luke, with investigation into nature of their literary interdependence and the oral tradition on which they drew. Critical appraisal of special character of Fourth Gospel. First Year.

303. BIBLICAL INSPIRATION (1)

The fact and nature of biblical inspiration, inerrancy, and extension of biblical inspiration. First Year.

304. ACT OF FAITH (2)

Consideration of Faith in the Old Testament, Synoptics, Johan-

nine writings, and St. Paul. Synthetic presentation of nature and qualities of Christian faith. First Year.

305. THE FOUNDING OF THE CHURCH (4)

Exegesis and historical critique of biblical texts bearing on the intent of Jesus to found the Church and on the major steps in its founding. The role of Peter and the Twelve; Petrine and apostolic succession. First Year.

306. TRADITION AND MAGISTERIUM (2)

Theological consideration of the transmission of revelation through written and unwritten traditions. Relation between Scripture and Tradition. Episcopal and Papal magisterium, its properties and objects. First Year.

307. THE NATURE AND MISSION OF THE CHURCH (2)

Theological consideration of the Church as the Body of Christ; of the purpose of the Church; of its necessity for salvation. First Year.

DOGMATIC THEOLOGY

211. EXISTENCE AND NATURE OF GOD (2)

A more concentrated and selective treatment of the contents of course 311. Second and Third Years.

212. KNOWLEDGE, WILL, AND PROVIDENCE OF GOD (1)

A more concentrated and selective treatment of the contents of course 312. Second and Third Years.

213. ACTUAL GRACE (4)

A more concentrated and selective treatment of the contents of course 313. Second and Third Years.

214. GOD THE CREATOR (2)

A more concentrated and selective treatment of the contents of course 314. Second and Third Years.

215. SUPERNATURAL ORDER (3)

A more concentrated and selective treatment of the contents of course 315. Second and Third Years.

216. THE LAST THINGS (2)

A more concentrated and selective treatment of the contents of course 316. Second and Third Years.

217. THE TRINITY (4)

A more concentrated and selective treatment of the contents of course 317. Second and Third Years.

218. THE TRINITY IN US (3)

A more concentrated and selective treatment of the contents of course 318. Second and Third Years.

219. CHRISTOLOGY (3)

A more concentrated and selective treatment of the contents of course 319. Second and Third Years.

220. REDEMPTION (2)

A more concentrated and selective treatment of the contents of course 320. Second and Third Years.

221. MARIOLOGY (2)

A more concentrated and selective treatment of the contents of course 321. Second and Third Years.

223A.-
223B. SACRAMENTS I (4-3)

A more concentrated and selective treatment of the contents of course 323. Fourth Year.

224A.-
224B. SACRAMENTS II (4-3)

A more concentrated and selective treatment of the contents of course 324. Fourth Year.

311. EXISTENCE AND NATURE OF GOD (2)

An historical and systematic presentation of the content of revelation concerning the problem of God; know-ability of God's existence by light of human reason; divine essence and attributes. Second and Third Years.

312. KNOWLEDGE, WILL, AND PROVIDENCE OF GOD (2)

A theological treatment of divine knowledge and will, involving questions of scope and mode of divine cognition, providence, salvific will, predestination. Second and Third Years.

313. ACTUAL GRACE (4)

An historical and systematic treatment of the necessity and gratuity of grace, of the nature of actual grace, its properties and distribution. Second and Third Years.

314. GOD THE CREATOR (2)

A systematic theological study of the origin of the universe, with special emphasis on the problems concerning the origins of men and angels; nature of men and angels theologically regarded. Second and Third Years.

315. SUPERNATURAL ORDER (4)

An historical and systematic treatment of the supernatural order, with special attention to its ultimate goal; initial supernatural state of man; original sin, nature and effects. Second and Third Years.

316. THE LAST THINGS (2)

A dogmatic study of the Last Things, with special stress on recent studies in biblical theology, notably the place of the Last Things in the redemptive mission of Christ. Second and Third Years.

317. THE TRINITY (4)

An historical and systematic study of the doctrine of the Trinity, of the divine processions, relations, and missions of the divine persons. Second and Third Years.

318. THE TRINITY IN US (4)

Of the mission of the Holy Spirit by the Father and the Son to the soul in grace, of habitual grace, the virtues, and other aspects of justification. Second and Third Years.

319. CHRISTOLOGY (4)

An historical and systematic treatment of the Incarnation as found in the theological 'loci', with particular stress on the genesis and current relevance of early conciliar formulas. Second and Third Years.

320. REDEMPTION (2)

An historical and systematic study of the Atonement, with emphasis on a critical evaluation of the patristic elaboration and Scholastic schematization in the light of current biblical theology. Second and Third Years.

321. MARIOLOGY (2)

Mariology, its nature and purpose. Mary as virginal Mother of God, prerogatives of divine maternity, function of Mary in the divine plan of man's redemption. Second and Third Years.

323A.-
323B. SACRAMENTS I (4-4)

An historical and systematic treatment of the sacramental system in general, and of the Sacraments of Baptism, Confirmation, and the Holy Eucharist in particular. Fourth Year.

324A.-
324B. SACRAMENTS II (4-4)

An historical and systematic treatment of the remaining four Sacraments, viz., Penance, Extreme Unction, Holy Orders, Christian Matrimony. Fourth Year.

SACRED SCRIPTURE

325. OLD TESTAMENT I. PROPHETICAL AND SAPIENTIAL BOOKS (4)

Study of prophetism. Survey of major and minor prophets, with special attention to Isaiah and Jeremiah. Third and Fourth Years.

326. OLD TESTAMENT II. HISTORICAL BOOKS (4)

Study of Pentateuchal problem in light of current linguistic and archeological research. Survey of historical books, with emphasis on the Old Testament plan of salvation. Third and Fourth Years.

327. NEW TESTAMENT I. SYNOPTIC GOSPELS AND JOHANNINE LITERATURE (4)

Study of structure and content of each of four Gospels, Johannine Epistles, and Apocalypse. Exegesis of selected passages. Comparison of theology of Synoptic Gospels with Johannine Gospel and Epistles. Second and Third Years.

328. NEW TESTAMENT II. ACTS OF APOSTLES, PAULINE AND CATHOLIC EPISTLES (4)

Introductory survey of Acts of Apostles. Life of St. Paul; introduction to individual Epistles; detailed exegesis of a single Epistle; selected passages from others. Development of St. Paul's theology. Second and Third Years.

MORAL THEOLOGY

238. PASTORAL THEOLOGY (1)

Study of techniques for the apt performance of specialized forms of the sacred ministry, such as parochial duties, hospital chaplaincy, preparation of marriage cases. First and Second Years.

331. MORAL THEOLOGY I-A (5)

A study of the theological bases of the general principles of Christian morality and of the theological virtues. First and Second Years.

332. MORAL THEOLOGY I-B (5)

A study of the Ten Commandments and of the virtues, except chastity. First and Second Years.

333-
334. MORAL THEOLOGY II (5-5)

A study of the virtue of chastity and the moral and canonical aspects of the Seven Sacraments. First and Second Years.

335. METHODS OF INTERVIEW AND COUNSELING I (1)

Application of moral and ethical principles to individual problems. Techniques involved in the interview. Practical solutions to be given with regard to particular circumstances of personality, occupation, and environment. First Year.

336. METHODS OF INTERVIEW AND COUNSELING II (1)

Continuation of preceding course. Second Year.

337. METHODS OF INTERVIEW AND COUNSELING III (1)

Continuation of preceding course. Third Year.

338. METHODS OF INTERVIEW AND COUNSELING IV (1)

Continuation of the preceding course. Fourth Year.

CANON LAW

339. INSTITUTIONS OF ECCLESIASTICAL LAW I (3)

A study of the general norms of ecclesiastical law and of the principles of its interpretation. Ecclesiastical jurisdiction and its delegation. The law of the clerical state. Selected questions concerning the states of Christian perfection. First and Second Years.

340. INSTITUTIONS OF ECCLESIASTICAL LAW II (3)

A survey of ecclesiastical legislation concerning sacred times and places, divine worship, and the teaching of Christian Doctrine. Extensive treatment of ecclesiastical penal law: its general principles and specific applications. First and Second Years.

351. CHURCH HISTORY I (3)

Survey from Pentecost to end of Thirteenth Century, emphasizing life in primitive Church, monastic growth. General Councils, rise of papacy from its age of iron to feudal dominance under Innocent III. First and Third Years.

352. PATROLOGY (1)

A study of the writings of the early Church Fathers under the form of literary history, thus providing general introduction to Patristics and training in correct use of patristic argumentation. First and Third Years.

353. CHURCH HISTORY II (4)

Survey from Boniface VIII to present. Growth of laicism from Avignon to Renaissance, subsequent religious revolts and Catholic restoration. Struggle of post-Tridentine Church with Jansenism, Gallicanism, modern forms of statolatry. First and Third Years.

B. Auxiliary Disciplines

341. ELEMENTARY HEBREW I (1)

Study of the essentials of Hebrew grammar and the peculiar modes of semitic expression. Analysis of selected passages of the Hebrew Old Testament. First Year.

342. ELEMENTARY HEBREW II (2)

Fundamentals continued.

343. INTRODUCTION TO OLD TESTAMENT (1)

General Introduction to Sacred Scripture. Historical, geographical, and cultural background of Old Testament. Canon, texts, and versions. First Year.

344. BIBLICAL GREEK (1)

Study of the orthography, morphology, and syntax of New Testament Koine, stressing peculiarities of Koine in relation to Classical Greek. Analysis of selected passages of Greek New Testament. First Year.

345. INTRODUCTION TO NEW TESTAMENT (1)

Historical, geographical, and cultural background of the New Testament. Canon, texts, and versions.

361. ORIENTAL THEOLOGY (1)

Study of history and present status of dissident Oriental Churches to understand ways and means of fostering reunion. Special emphasis on Oriental theological method, rites, attitudes, customs. First and Second Years.

365. LITURGY (1)

Study of Sacraments and other ecclesiastical rites for a better understanding of the functions performed by liturgy in the life of the Church. First and Second Years.

367. ASCETICAL THEOLOGY (1)

A study of the nature of Christian asceticism and mysticism, particularly in the light of the historical genesis and structural analysis of St. Ignatius' "Spiritual Exercises." Fourth Year.

C. Special Disciplines

231. CATECHETICS (1)

An historical and speculative study of catechetical instruction in the basic doctrines and practices of the Christian Faith, with special emphasis on proper finality, structure, methodology of presentation. Second, Third, and Fourth Years.

291. THEOLOGY WORKSHOP I (1)

Group participation in the study of the proper and effective presentation of selected theological topics. Third Year.

292. THEOLOGY WORKSHOP II (1)

Continuation of preceding course. Fourth Year.

294. RESEARCH SEMINAR (2)

This seminar is similar to that described in 394 and is required in the curriculum for the degree of Master of Arts in Theology.

295-
298. SEMINARS (2)

Elective seminars in the curriculum of the Master of Arts in Theology.

371A.-
371B. HEBREW SYNTAX (3-3)

Study in syntax with selected Old Testament readings.

372A.-
372B. HEBREW RAPID READING: HISTORICAL BOOKS (1-1)

373A.-
373B. HEBREW RAPID READING: PROPHETS (1-1)

376A.-
376B. GREEK RAPID READING: GOSPELS (1-1)

377A.-
377B. GREEK RAPID READING: EPISTLES OF ST. PAUL (1-1)

380. SPEECH COMPOSITION AND PRESENTATION (1)

Audience analysis, analysis of structure and form, organization of material, basic voice and bodily action for speech. First Year.

381. ADVANCED PUBLIC SPEAKING AND ORAL INTERPRETATION (1)

Development of techniques of analysis and presentation for reading aloud, the application of the principles of speaking and reading to a variety of forms. Speech and sermon situations. Second Year.

385. PULPIT FORMS AND TECHNIQUES (1)

Sermon composition, the various sermon patterns, and presentation of written sermons. Third Year.

386. RESEARCH SPEECH SEMINAR (2)

Projects in the theory of speech as applied to various sermon problems. Elective course for Fourth Year.

388. ECCLESIASTICAL RITES (1)

Special instruction and practice in rubrical administration of the Sacraments, in the manner of saying Mass, and performing other sacred functions. Third Year.

394. RESEARCH SEMINAR (2)

Required in the curriculum for the degree of Master of Sacred Theology. This is a group research project. Each participant is obliged to submit a seminar paper which is kept on file in the Alma College Library.

395-
398. SEMINARS (2)

Elective seminars in the curriculum for the degree of Master of Sacred Theology.

OFFICERS OF ADMINISTRATION

Joseph J. Farraher, S.J. . . . . President
William J. Keenan, S.J. . . . . Executive Vice-President
Harry T. Corcoran, S.J. . . . . Dean
Thomas W. Leahy, S.J. . . . . Secretary of Faculty
Edward Hagemann, S.J. . . . . Spiritual Counselor
John J. Alhadef, S.J. . . . . Librarian
Ralph Massey, S.J. . . . . Treasurer

ACADEMIC COUNCIL

Joseph J. Farraher, S.J. . . . . Chairman
Harry T. Corcoran, S.J.
Thomas W. Leahy, S.J.
Edward D. McShane, S.J.
John H. Wright, S.J.

LIBRARY STAFF

John J. Alhadef, S.J., A.M., M.L.S., S.T.M. . . . . Librarian
John R. Moholy, S.J., A.M., S.T.B. . . . . Asst. Librarian

FACULTY

HARRY T. CORCORAN, S.J. (1947), Dean
Professor of Dogmatic Theology

A.B., 1937, A.M., 1938, Gonzaga University; S.T.L., 1945, Alma College; S.T.D., 1948, The Pontifical Gregorian University.

ROBERT H. DAILEY, S.J. (1956)
Professor of Moral Theology

A.B., 1936, A.M., 1937, Gonzaga University; S.T.L., 1944, Bellarmine College (China); J.C.D., 1951, The Pontifical Gregorian University.

JOSEPH J. FARRAHER, S.J. (1951)
Professor of Moral Theology

A.B., 1940, A.M., 1941, Gonzaga University; S.T.L., 1948, Alma College, S.T.D., 1952, The Pontifical Gregorian University.

FACULTY

WILLIAM M. HAGAN, S.J. (1960)
Assistant Professor of Dogmatic Theology

A.B., 1949, A.M., 1950, Gonzaga University; S.T.L., 1957, West Baden College; S.T.D., 1960, Woodstock College.

JAMES D. HARAN (1958)
Lecturer in Speech

A.B., 1947, San Francisco State College; A.M., 1951, Stanford University.

RICHARD A. HILL, S.J. (1963)
Assistant Professor of Canon Law

A.B., 1951, Ph.L., 1952, Gonzaga University; S.T.M., 1959, University of Santa Clara; J.C.D., 1963, The Pontifical Gregorian University.

JOHN E. HUESMAN, S.J. (1957)
Professor of Sacred Scripture

A.B., 1942, A.M., 1943, Gonzaga University; S.T.L., 1950, Alma College; Ph.D., 1955, The Johns Hopkins University; S.S.L., 1956, The Pontifical Biblical Institute.

THOMAS W. LEAHY, S.J. (1959)
Assistant Professor of Sacred Scripture

A.B., 1944, A.M., 1949, St. Louis University; S.T.L., 1952, Alma College; Ph.D., 1957, The Johns Hopkins University; S.S.L., 1958, The Pontifical Biblical Institute.

JAMES F. MARA, S.J. (1951)
Assistant Professor of Dogmatic Theology

A.B., 1939, Gonzaga University; A.M., 1940, S.T.L., 1947, Weston College (Massachusetts).

J. FENTON MCKENNA (1947)
Lecturer in Speech

Ph.B., 1928, LL.B., 1930, J.D., 1933, University of Santa Clara.

EDWARD D. MCSHANE, S.J. (1950)
Professor of Church History

A.B., 1938, A.M., 1939, Gonzaga University; S.T.L., 1946, Alma College; H.Eccl.D., 1950, The Pontifical Gregorian University.

BEN F. MEYER, S.J. (1963)
Assistant Professor of Fundamental Theology

A.B., 1950, A.M., 1951, Gonzaga University; S.T.M., 1958, University of Santa Clara; S.S.L., 1961, The Pontifical Biblical Institute.

TERRENCE R. O'CONNOR, S.J. (1950)
Associate Professor of Patrology

A.B., 1939, A.M., 1940, Gonzaga University; S.T.L., 1947, Alma College; S.T.D., 1950, The Pontifical Gregorian University.

DANIEL J. O'HANLON, S.J. (1958)
Professor of Fundamental Theology

A.B., 1945, A.M., 1946, Gonzaga University; S.T.L., 1953, St. Joseph's College (Ireland); S.T.D., 1958, The Pontifical Gregorian University.

FACULTY

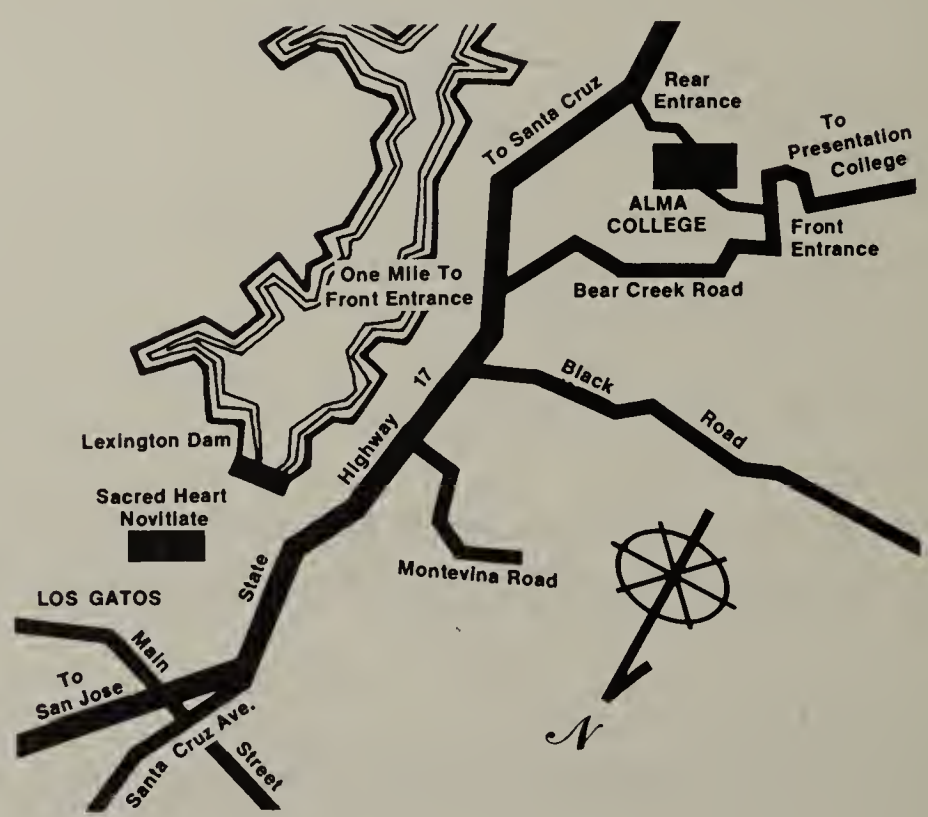
JOSEPH M. POWERS, S.J. (1962)
Assistant Professor of Dogmatic Theology
A.B., 1949, A.M., 1950, Gonzaga University; S.T.M., 1959, Alma College.

FRANCIS L. SHEERIN, S.J. (1934)
Professor of Dogmatic Theology
A.B., 1917, A.M., 1918, Gonzaga University; S.T.D., 1925, Mag. Aggreg., 1927, The Pontifical Gregorian University.

GEORGE E. STEINER (1963)
Lecturer in Speech
A.B., 1947, Fresno State College; A.M., 1950, Wayne State University; Ph.D., 1959, University of Southern California.

JOSEPH B. WALL, S.J. (1951)
Associate Professor of Dogmatic Theology
A.B., 1939, A.M., 1940, Gonzaga University; S.T.L., 1947, Alma College; S.T.D., 1959, The Pontifical Gregorian University.

JOHN H. WRIGHT, S.J. (1959)
Associate Professor of Dogmatic Theology
A.B., 1945, A.M., 1946, Gonzaga University; S.T.L., 1953, Alma College; S.T.D., 1957, The Pontifical Gregorian University.



VII

THE UNIVERSITY OF SANTA CLARA

MILITARY SCIENCE

UNIVERSITY OFFICERS

UNDERGRADUATE REGULATIONS

APPENDIX

ACCREDITATIONS AND MEMBERSHIPS

ONE HUNDRED and FOURTEENTH YEAR
1964-1965

Member National Catholic Educational Association

Member Jesuit Educational Association

Accredited by the Western Association of Schools and Colleges

Member American Council on Education

Member Council of Graduate Schools in the United States

Accredited by Engineering Council for Professional Development

Approved by the American Bar Association

Member Association of American Law Schools

Approved by the American Medical Association

Accredited by the American Chemical Society

Accredited by the State Bar of California

Accredited by American Association of
Collegiate Schools of Business Administration

Conference of Jesuit Law Schools

Member of Western Conference of Law Schools

Member of College Entrance Examination Board

Member of Association of American Colleges

Accredited by California State Board of Education

Institutional Member of the American Mathematical Society

THE UNIVERSITY OF SANTA CLARA
SANTA CLARA, CALIFORNIA
OCTOBER, 1964

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MILITARY SCIENCE

MILITARY SCIENCE

ROBERT A. O'BRIEN, JR., *Colonel*

The University maintains a Senior Division Unit of the Reserve Officers Training Corps to provide facilities whereby students can better prepare themselves for their citizenship responsibilities.

The ROTC is designed to develop qualities of leadership in college-trained men in order to provide a corps of well-educated, well-rounded officers for the Components of the Army. By combining regular academic pursuits with a course of military instruction, the graduate is equipped for roles of leadership and command responsibility.

The program offered consists of a two-year basic and a two-year advanced curriculum. All undergraduates are required to take the two-year basic program unless exempted by the Faculty Committee on Petitions. They may petition for relief from this requirement, but they must report to the Military Science Department at initial registration and be enrolled in Military Science, pending action on any petition submitted.

Petitions for exemption from, or deferment of, military training will not be received after the end of the first week of attendance in the semester, except for physical disability incurred following enrollment.

Exemptions from military training may be granted in the following cases:

1. Veterans of any of the Armed Services.
2. Students who have reached the age of 23 years at the time of initial registration at the University.
3. Physically disqualified as certified by the University physician.
4. Noncitizen of the United States.
5. Students whose military training at other universities or military academies is accepted by the Professor of Military Science as fulfilling the requirements.
6. Students entering the University with upper-division standing.

Students who enter the University with advanced academic standing may be liable for completion of the courses in Military Science. Such cases will be considered on an individual basis, and appropriate placement will be determined by the Professor of Military Science with concurrence of the University Administration.

ADMISSION INTO ADVANCED ROTC

Admission to the advanced course is limited to those students who will not have reached their 28th birthday by date of their commission (graduation). They must also have completed the basic curriculum, or have equivalent credit, and pass prescribed academic and physical examinations.

Students who meet the above requirements may be selected by the President of the University and the Professor of Military Science for admission to the advanced program.

Advanced-course students are under contract with the Government to complete their training, unless sooner discharged for the convenience of the Government, and will be paid a monthly monetary allowance at a daily rate equal to the value of the Army ration ($.90 per day) for a period of not to exceed 595 days.

ROTC CAMP

Advanced-course students are required to attend ROTC Camp, normally in the summer between the junior and senior years. The six weeks of training supplements campus instruction by work in the field. Included are tactical and technical field exercises and training in the arms and services. Emphasis is placed on the development of leadership and individual ability to function effectively as an officer in a small unit. While at summer camp, the advanced-course student will be paid at the rate prescribed for a soldier with less than four months' service ($83.20 per month) and, in addition, will be allowed a travel allowance of 5 cents per mile to and from camp.

CONDITIONS GOVERNING ENROLLMENT

Enlisted membership in a Reserve Unit or a Reserve Program of any of the Armed Services is not recognized as a valid reason for exemption from the mandatory participation in the basic program, unless the student has completed four or more months of continuous active duty for training or active service.

A veteran is exempt from the military training requirements. His military service will normally qualify him for entrance into the advanced curriculum at the start of his junior year. Veterans are encouraged to consider this opportunity to obtain a commission in the United States Army Reserve.

Uniforms and textbooks are furnished by the Government without cost to the student. The advanced students are furnished a complete uniform which, upon completion of the program, may be retained for use on active or reserve duty.

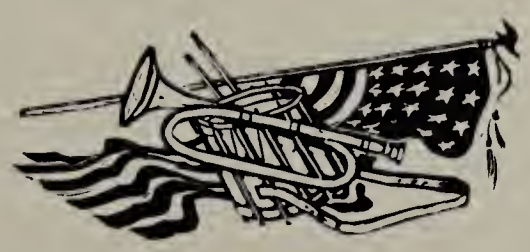
At the end of the school year, or if the student leaves the University prior to that time, all Government property, including texts, must be returned to the Military Science Department. Any loss or damage to equipment must be paid for by the student.

Each advanced course student who signs the ROTC Deferment Agreement is placed in classification 1-D which defers him from active service while he is a student in good standing at the University and until he receives both his baccalaureate degree and his reserve commission as a Second Lieutenant. This deferment is cancelled immediately upon dismissal from the Advanced ROTC Program.

COMMISSION IN U.S. ARMY RESERVE AND REGULAR ARMY

Students who complete the advanced program are eligible for appointment and commission by the President of the United States as officers in the United States Army Reserve. Reserve commissions are tendered in all branches of the Army except the Medical, Dental, and Chaplain Corps. The branch in which a student is commissioned is determined by his preference, leadership potential, academic background, recommendations of the faculty and staff, and needs of the service. A newly commissioned officer will normally attend his branch school upon being ordered to active duty. Current laws and regulations require each advanced-course student, upon receipt of his commission, to perform a tour of active duty as an officer for a period of two years, and to be a member of a reserve organization for a subsequent period of four years. Delays in reporting on active duty may be granted to students if they desire to study for an advanced degree. A student may be delayed from call to active duty for a period not to exceed four years, provided he is enrolled in a full-time program of instruction leading toward an advanced degree and remains in good academic standing with the college or university in which enrolled.

A student who has received his academic degree and has been designated a "Distinguished Military Graduate" by the President of the University and the Professor of Military Science may, upon application, be commissioned directly in the Regular Army.



COURSE DESCRIPTIONS

Basic Course

(11)-(12)-(13) FIRST YEAR. Organization of the Army and ROTC; Marksmanship; U.S. Army and National Security; Leadership, Drill, and Command. One hour lecture and one hour laboratory for all three terms.

*20-(21)-(22)-(23) SECOND YEAR. (1 Term Course) Yr. Map and Aerial Photograph Reading; American Military History; Introduction to Operations and Basic Tactics; Leadership, Drill, and Command. Four hours lecture and one hour laboratory for one term; one hour lecture and one hour laboratory for two terms.

Advanced Course

(111)-(112)-(113) FIRST YEAR. Leadership Techniques; Military Teaching Principles; Mission and Functions of the Branches of the Army; Small Unit Tactics and Communications; Leadership, Drill, and Command. Two hours lecture and one hour laboratory for all three terms.

*120-(121)-(122)-(123) SECOND YEAR. (1 Term Course) Yr. Operations; Military Intelligence; Training Management; Logistics; Supply and Movement of Small Units; Army Administration; Military Law; Role of the United States in World Affairs; Service Orientation; Leadership, Drill, and Command. Four hours lecture and one hour laboratory for one term; two hours lecture and one hour laboratory for two terms.

Academic Subject

In the first, third, and fourth years, an academic term course will be chosen from one of the following areas, subject to the approval of the Professor of Military Science:

Effective Communication.
Science Comprehension.
General Psychology.
Political Development and Political Institutions.

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*Numbers in parentheses are for use in scheduling Military Science classes during terms other than those in which a term course is listed. MS 20 and MS 120 designate term courses for which academic credit toward graduation is granted.

RESERVE OFFICER TRAINING CORPS

FACULTY

LESTER H. BIRTCHET, S/SGT. (1963)
Instructor in Military Science

WILLIAM G. CHISHOLM, MAJ. (1962)
Associate Professor of Military Science
B.S., 1940, University of Idaho.

ALFRED A. CINI, CAPT. (1962)
Assistant Professor of Military Science
B.S., 1955, United States Military Academy.

RICHARD E. CROWDER, SFC. (1962)
Instructor in Military Science.

ROBERT P. GLASSON, CAPT. (1963)
Assistant Professor of Military Science
B.S., 1954, University of Oregon.

ALVA W. HAYES, MAJ. (1962)
Assistant Professor of Military Science
B.A., 1953, Texas Western College.

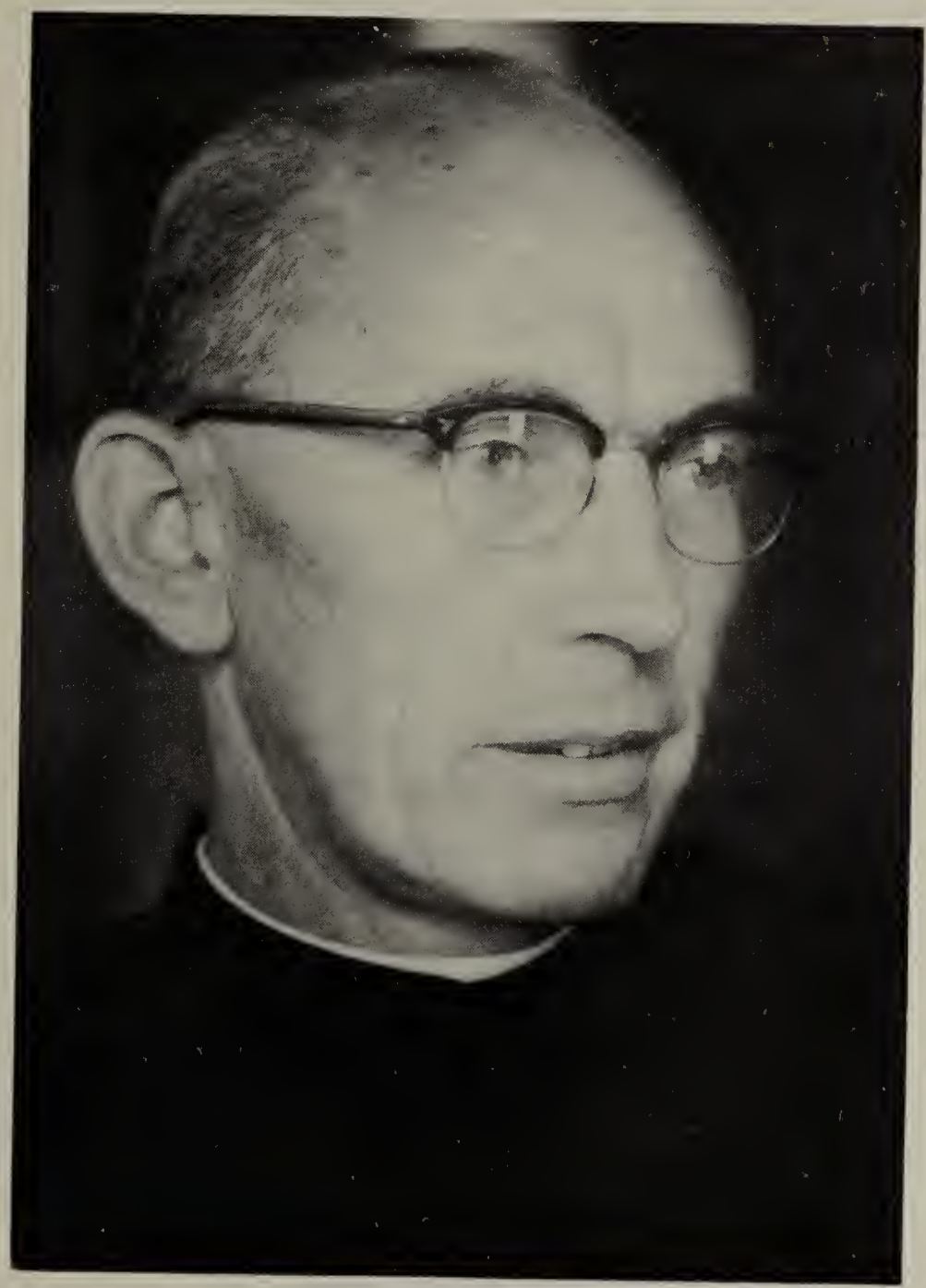
MERLE E. JERNIGAN, S/SGT. (1961)
Instructor in Military Science.

JOHN W. LONG, SGT. (1962)
Instructor in Military Science.

ROBERT A. O'BRIEN, JR., COL. (1961)
Professor of Military Science
B.S., 1940, United States Military Academy.

PAUL M. PAYSON, MAJ. (1961)
Assistant Professor of Military Science
A.B., 1950, University of Maine.

UNIVERSITY OFFICERS



PATRICK A. DONOHOE, S.J.
President

The Corporate Title of the University is

PRESIDENT AND BOARD OF TRUSTEES
OF SANTA CLARA COLLEGE

BOARD OF TRUSTEES

Patrick A. Donohoe
President

Austin J. Fagothey
Vice-President

Charles F. Guenther
Secretary-Treasurer

Edward R. A. Boland

Joseph S. Brusher

Raymond F. Copeland

Anthony F. Frugoli

Alexis I. Mei

Joseph J. Pociask

Walter E. Schmidt

Thomas D. Terry

Victor A. Chargin
Consulting Attorney

BOARD OF REGENTS

OF THE UNIVERSITY OF SANTA CLARA

Mr. Benjamin H. Swig, San Francisco, California
Chairman

Mr. B. A. Bannan, San Marino, California
Mrs. G. Allan Hancock, Santa Maria, California
Mr. William V. Regan, Jr., Menlo Park, California
Mr. James C. O'Malley, Phoenix, Arizona
Mr. James F. Twohy, San Jose, California
Dr. Anthony E. Allegrini, Santa Cruz, California
Mr. George W. Artz, Sacramento, California
Mr. Edward U. Bevilacqua, Pleasanton, California
Dr. Edward W. Boland, Los Angeles, California
Dr. Salvador V. Campisi, San Jose, California
Mr. James K. Carr, San Francisco, California
Mr. Harry L. Crosby, Hillsborough, California
Mr. Edward J. Daly, Orinda, California
Mr. Laurence G. Duerig, Atherton, California
Mr. Patrick J. Frawley, Jr., Los Angeles, California
Mr. Frank Gentles, San Francisco, California
Mr. Joseph George, Jr., San Jose, California
Mr. Russell Giffen, Fresno, California
Capt. G. Allan Hancock, Santa Maria, California
Mr. Edwin A. Heafey, Piedmont, California
Mr. Thomas E. Leavey, Beverly Hills, California
Mr. John F. Marten, Los Angeles, California
Mr. Lloyd L. Mazzera, Oakland, California
Mr. John F. O'Hara, Palos Verdes, California
Mrs. John E. O'Neill, Fresno, California
Mr. Michel Orradre, San Ardo, California
Mr. Charles P. Partridge, Oakland, California
Mr. Peter J. Pasetta, Saratoga, California
Dr. Walter Rapaport, San Jose, California
Mr. Philip S. Sanfilippo, San Jose, California
Mr. Lawrence T. Shaw, Menlo Park, California
Mr. Horace C. Stoneham, San Francisco, California
Mrs. Charles Strub, San Marino, California
Mr. Harold J. Toso, San Francisco, California

ADMINISTRATION

Patrick A. Donohoe, S.J., Ph.D.	*President*
Alexis I. Mei, S.J., Ph.D.	*Academic Vice-President*
William J. Perkins, S.J., M.A.	*Vice-President for Student Services Academic Marshal*
Charles F. Guenther, S.J., M.A.	*Vice-President for Finance*
Walter E. Schmidt, S.J., M.A.	*Vice-President for Development and University Relations*
Thomas D. Terry, S.J., Ph.D.	*Dean, College of Arts and Sciences*
John M. Hynes, S.J., M.A.	*Associate Dean, College of Arts and Sciences; Director of Graduate Division*
J. Richard Draper, S.J., M.A.	*Associate Dean, College of Arts and Sciences*
Charles J. Dirksen, M.S.C.	*Dean, School of Business*
John Pagani, Ph.D.	*Associate Dean, School of Business*
Robert J. Parden, Ph.D.	*Dean, School of Engineering*
Leo A. Huard, LL.B.	*Dean, School of Law*
Harry T. Corcoran, S.J., S.T.D.	*Dean, School of Sacred Theology*
Philip J. Oliger, S.J., M.A.	*University Chaplain*
Patrick J. Carroll, S.J., M.A.	*Student Counselor*
Everett J. Hogan, S.J., M.A.	*Student Counselor*
Jerald G. McGrath, B.A.	*Dean of Men*
Viola F. Kamena, M.A.	*Dean of Women*
David P. Arata, B.S.	*Registrar*
William J. Loftus	*Comptroller*
Thomas A. Dodds, B.A.	*Purchasing*
Edward R. A. Boland, S.J., M.A.	*Librarian*
James E. Sweeters, S.J., M.A.	*Director, Athletics*
Louis I. Bannan, S.J., M.A.	*Representative, Alumni Faculty*
Joseph C. Tobin, B.S.	*Alumni Association Executive Secretary*
Marguerite L. Major, B.A.	*News Director*
Lee O. Case, B.A.	*Director of Development*
Frank A. Schneider, B.S.C.	*Director of Financial Aids*
William J. Perkins, S.J., M.A.	*Director of Placement*
Carl M. Fischer, M.Ed.	*Director of the Office of Testing and Guidance*
Paul B. Murphy, B.A.	*Director of Publications*
Joseph J. Pociask, S.J., M.A.	*Director de Saisset Art Gallery*
Anthony F. Frugoli, S.J., M.A.	*Director, Student Infirmary*
Richard W. Jonsen, B.A.	*Associate Director of Admissions*

UNDERGRADUATE REGULATIONS

ACADEMIC REQUIREMENTS AND REGULATIONS

COURSE REQUIREMENTS

The undergraduate program is scheduled on a basis of three eleven-week terms per academic year of nine months. The eleventh week will be devoted to examinations. During the freshman and sophomore years the student schedules four courses per term, and he schedules three courses per term during his junior and senior years. These forty-two courses in four academic years is the requirement for the Bachelor's degree in all departments.

Classes are normally scheduled on Monday, Tuesday, Thursday, and Friday. The Santa Clara plan of academic performance envisions considerable independent study by the students. Wednesday will be kept free of laboratories, examinations, and seminars, to provide uninterrupted study periods. No student activities will be scheduled prior to 3 P.M., except military drill at 9:00 A.M.

No lower-division student may carry less than three courses per term without the approval of his Dean. No lower-division student may carry more than four courses per term. No upper-division student may carry less than two term courses without the approval of his Dean. No upper-division student may carry more than three term courses.

A sophomore may take an upper-division course if approved by his dean and provided his program does not exceed four courses.

To relate the term-courses system to other systems of credit, lower-division courses which are taken four at a time are considered equivalent to a four-quarter-unit course, and courses taken in the upper division, three at a time, are equivalent to a five-quarter-unit course.

A part-time student is defined as a lower-division student taking less than three term courses, and an upper-division student enrolling in fewer than two term courses. A full-time student who drops courses during the course of a term will be considered full-time for the balance of that term.

MARKING SYSTEM

A student's grade of scholarship is given according to the following marks:

A	Excellent	I	Incomplete
B	Good	W	Withdrawal
C	Satisfactory	W/F	Withdrawal failing
D	Inferior	W/P	Withdrawal passing
F	Failure		

A student must earn a C average in all work undertaken in order to qualify for the Bachelor's degree. To determine a numerical average, 4 grade points are assigned for each A, 3 for a B, 2 for a C, 1 for a D, and 0 for an F. To arrive at the grade-point average, the total earned grade points are divided by the number of courses which have been undertaken. A C average is 2.0.

REPETITION OF COURSES

A student may, with permission, repeat a course. If a grade of D or F was received on the first attempt, the student should use the letter R in registering for the course again. All grades, whether repeated or not, will be used in computing the student's performance.

WITHDRAWING FROM COURSES

Lower-division students may withdraw from courses without penalty up to one week after mid-term grade reports have been turned in. Upper-division students cannot withdraw beyond the first week.

ENTERING NEW COURSES

Students may enter a course for the first time only during the first week of classes of the term.

TRANSFER CREDIT

Students who transfer a specific course to the University from another institution will not accumulate credit for these courses unless they are accumulated in sufficient quantity to total the quarter unit equivalent of a term course.

The student's grade-point average is computed only on work done at Santa Clara. Collegiate work at another institution with a grade of C or better may be transferred to Santa Clara and counted in fulfillment of graduation requirements, but it will not be counted in determining the student's grade-point average and rank in class.

INCOMPLETES

A student's work may be reported incomplete if, due to unavoidable circumstances, some essential portion of his work in the course remains unfinished after the final examination. An incomplete becomes a failure unless the unfinished work is completed to the satisfaction of the instructor within a period of one year.

ACADEMIC PROBATION, SUSPENSION, DISQUALIFICATION

Probation

A student who receives one F or two D's in a term will be placed on probation. A student will be off probation at any time when his average is only one grade-point below a C average.

Suspension

A student who remains on probation two terms in a row is subject to suspension for up to one year.

Disqualification

Normally, students are disqualified only after they have returned to the University following an academic suspension and again go on academic probation. At the discretion of the Dean of the School, a student may be permanently disqualified without previous probation, or suspension, for unsatisfactory academic performance.

A student who does not have an over-all C average and a C in his major at the beginning of his final term will not be permitted to graduate at the end of that term.

WRITTEN EXAMINATIONS

Written examinations are held at the middle and end of each term. A report of the student's progress is prepared by the Registrar's office and mailed to his parents only at the end of the term. Students earning a D or F at the mid-term will be notified.

A student guilty of dishonesty in an examination will be given a failure for the course. In special cases, the administration may impose the penalty of dismissal from the University.

WITHDRAWAL FROM THE UNIVERSITY

When a student withdraws from the University, he must report to the Registrar for a Withdrawal Form and complete the necessary procedure.

MILITARY SCIENCE

Lower-division students enrolled in the basic ROTC courses will receive one term credit during the one term in the sophomore year in

which they attend classes four days a week, plus a one-hour military drill. During the remaining five terms of their lower-division program, they will attend one lecture and one drill per week, for which they will receive no grade and no credit.

Students who elect to enroll in the ROTC advanced program will receive one term-course credit during the single term they attend class four days a week, plus one military drill. During the remaining five upper-division terms, they will attend two lectures and one drill per week, for which they will receive no grade and no credit. Upon completion of the advanced program, the University will certify the total number of hours spent in pursuing the Reserve Officer Training Corps program.

CHALLENGING COURSES

A course is said to be challenged when a student takes a special examination in the course for the purpose of obtaining full credit for it. He may prepare for this procedure by directed independent study.

Any course in the catalog may be challenged except those specifically identified in the catalog as exempted from challenge and those requiring laboratories.

To challenge a course, a student must have a 2.2 accumulative average and a 2.5 average in his major field. Freshmen and transfer students are not eligible to challenge a course until they have completed one term of work at Santa Clara. A student desiring to challenge a course should obtain a form from the Office of the Registrar on which he will identify the course as well as the course he has previously audited or challenged. He must then receive approval from an instructor in the department and the Dean of his School. A fee will be charged for each course challenged.

Normally the examinations for challenging courses will be given on the third Saturday of each term. The petition for challenging a course must be submitted at least two weeks before the examination date.

Grades will be issued for challenged courses in the same manner as those obtained through regular course work. Challenged courses may not be used in the performance of residence requirements. The department shall establish the level of performance to be obtained and any requirements in addition to an examination which will be three to four hours in duration.

AUDITING COURSES

Only students who are in the top 10 percent of their class, or have maintained a B average in the University, may audit a course. These students may audit one course in addition to the three courses they take in the upper division, or four courses taken in lower-division work. A student may not enroll as a course auditor and then decide to take the final examination for credit. If he wishes credit for an audited course, he may challenge the course during the following term by following the regular challenging procedure.

Students who are not full-time students must pay $125 per course for auditing. A student may not audit more than three courses during his four years at Santa Clara.

ATTENDANCE

Students are required to attend all classes. Penalties for absences are left to the discretion of individual instructors.

GRADUATION

The requirements for graduation can be summarized as follows:

1. Complete a 42 term-course program approved by the University as meeting the requirements for the particular degree.
2. Achieve an over-all academic performance level of a C which is a 2.0 numerical average.
3. Complete the residence requirement of at least 9 term courses normally in the year immediately preceding the awarding of the Bachelor's degree.
4. Satisfy the American History and Institutions requirement by examination (not for credit) or by courses completed at this or another University.

CHANGING COURSES, MAJORS, SCHOOL OR COLLEGE

Certain administrative procedures for changing course registration, changing majors within a College or School, changing from one School to another must be observed or the student will be incorrectly charged, to the possible detriment of his academic record. The necessary forms and procedures may be obtained from the Office of the Registrar.

RIGHTS RESERVED

The curriculum and regulations affecting students may be revised at any time at the discretion of the University administration.

STUDENT EXPENSES

Application Fee	$ 5.00
This charge is to be sent with each application form and is not refundable.	
Tuition per Quarter, 1964-1965	$367.00
Incidental Fee per Quarter, 1964-1965	$ 33.00
Tuition and required fees are due and payable in full one week before the beginning of each quarter.	
Room and Board per Quarter, 1964-1965	$300.00
Late Registration Fee	$ 20.00
Remedial English Course Subject "A", each course	$ 25.00
Remedial Reading Course, each course	$ 25.00
Late Submission of administrative forms (e.g., pre-registration, application for degrees, etc.), per day	$ 2.00
Charges for loss or damage in residence halls or to military equipment will be billed directly to the student and parents upon report of damage or loss.	
Breakage Card for chemistry courses (unused amount returned to student at close of course)	$ 5.00
Additional copies of student's transcript of grades, each	$ 1.00
Graduation	$ 25.00
Fee for each change in scheduled course	$ 2.00
Part-Time Student tuition, per course	$125.00
Room and Board Winter Recess (Christmas Holidays)	$ 50.00
Room only Winter Recess	$ 23.00
Room and Board Spring Recess	$ 25.00
Room only Spring Recess	$ 11.50
Resident students must bring their own blankets, bedspreads, sheets, and pillow cases.	
Laundry Deposit (Optional)	$ 35.00
Infirmary Room Charge (per day)	$ 10.00

For Graduate, and Summer Session, tuition and fees see announcements of Graduate Divisions, and Summer Session.

METHOD OF PAYMENT

Students should come prepared to pay all charges on the day of registration, or should have payments from home in the mail to reach the University at least ONE WEEK prior to the date of registration.

Remittances should be made payable to the "University of Santa Clara" and mailed to the Office of the Treasurer.

Students who have unpaid bills at the University or who defer payments without approval are subject to dismissal from the University

and, as long as such payments remain unpaid, may not receive transcripts of credits nor any diploma.

For those who are not financially able to pay the full term charges in advance, there are several tuition plans available. Those who plan to avail themselves of one of these services, should request information from the University at least one month prior to registration.

In addition, the University has several loan funds which are available to the students and their parents. These are:

National Defense Student Loan Fund. This fund is available to any student in good standing, including incoming freshmen. Application for a loan from this fund may be made through the Office of Financial Aids.

United Student Aid Loan Funds. These funds are available to sophomores, juniors, seniors and graduate students. Information may be obtained through the Office of Financial Aids.

The Catala Club Loan Fund. This fund, established and administered by the Catala Club, is available for students in sophomore, junior, and senior years. The officers of the Catala Club may be contacted through the University Business Office.

School of Law Loan Fund. This fund is available to students in the School of Law. Application may be made through the Dean of the School of Law.

REFUND OF TUITION

Undergraduate students who withdraw from the University may receive refunds of this charge according to the following scale of withdrawal:

Within one week after registration:
payment refunded minus ..... $ 50.00

Within two weeks after registration:
payment refunded minus 90.00

Within four weeks after registration:
payment refunded minus 150.00

For withdrawal after four weeks of classes there will be no refund of this charge.

REFUND OF ROOM AND BOARD

Refund of unused board will be pro-rated from the Monday following the date of withdrawal.

No refund will be made of the payment for a room in the University's residence halls.

Refunds cannot be processed until one month after the student's withdrawal. There will be no refund of fees.

SCHOLARSHIPS

All scholarships are administered by the Director of the Office of Financial Aids. In general, scholarships are granted on the basis of financial need and are granted to students who show promise of high scholastic attainment.

Freshmen who desire scholarship assistance should:

1. Obtain the forms for "Parents confidential statement" from the local high school. They should be completed by the parents and sent to College Information Service. Forms may also be obtained from the College Information Service, 1947 Center Street, Berkeley, California.
2. Submit an application for admission with the $5.00 application fee.
3. Request that a transcript of high school grades be submitted.
4. Obtain letters of recommendation as to character and achievement from the local high school Principal and the Senior Counsellor.
5. Apply to the College Examination Board at least one month before examinations are administered in December, January, or February, and request that the scores of the scholastic aptitude test be sent to Santa Clara.

Announcement of scholarship grants will generally not be made before May 1. Students who are recipients of scholarships must maintain an average of at least 3.0. A student who holds a scholarship must renew his petition for a scholarship each year during the month of May at the Office of Financial Aids.

Every resident of the State of California must make application to the State Scholarship Service first if he wishes to receive consideration by the University.

APPENDIX

ASSOCIATED STUDENTS

The Associated Students of the University of Santa Clara (ASUSC) is the student body organized for the conduct of student government. All fee-paying registered students are members.

The purposes of the ASUSC are to further the best interests of the University and its students, to encourage student activities, and to provide valuable experience and training in self-government and responsibility.

RELIGIOUS ORGANIZATIONS

The first thought of the University is the encouragement of a sound religious life for the men and women of the student body. Spiritual activities include The Confraternity of Christian Doctrine, The Sodality of the Blessed Virgin, The Lambdas (Liturgical Group), The Chaplain's Retreat Organization, and the Sanctuary Society.

NATIONAL SOCIETIES

Alpha Sigma Nu is a national honor society with chapters in various Jesuit colleges and universities throughout the United States. It is a society of honor students who have distinguished themselves in scholarship, service and loyalty to their college or university.

American Chemical Society Student Affiliates is an organization of students affiliated with the parent national group of chemists, the American Chemical Society. Affiliates are entitled to junior level participation in the sectional society meetings.

Beta Gamma Sigma, Delta Chapter, is a professional business honor fraternity to encourage and reward scholarship and accomplishment among students of commerce and business. It promotes the advancement of education in the art and science of business and fosters integrity in the conduct of business operations. Members are selected on the basis of high scholarship and good moral character.

Delta Sigma Pi, Sigma Xi Chapter of the Delta Sigma Pi National Commerce Fraternity, is a professional fraternity of students who are above average academically and who are leaders in the activities of the School of Business.

National Federation of Catholic College Students is a nationwide union of Catholic college students for the purpose of training its members to assume leadership in post-college life. The Federation strives to promote awareness of community responsibility, the need of Catholic lay leadership and the inherent unity of Catholic college people.

Pershing Rifles, a national society, has as its purpose to encourage, develop, and preserve the highest ideals of the military profession, to

provide appropriate recognition of a high degree of military ability among cadets of the Reserve Officers' Training Corps, and to instill in the membership the need for assuming civic responsibility. Active membership is open only to cadets of the Basic Course.

Scabbard and Blade is a national society composed of selected members of the Advanced ROTC. Its purposes are to unite in closer relationship the military departments of American universities and colleges, to develop the essential qualities of good and efficient officers, to prepare members to exert good influence in the military affairs of the communities in which they reside, and to spread intelligent information concerning the military requirements of our country.

Tau Beta Pi is a national engineering honor society. The California Zeta Chapter was installed to give increased recognition to outstanding scholastic achievement. Its members are selected on the basis of scholarship, integrity and diligence.

DEPARTMENTAL ORGANIZATIONS

The Arts and Sciences Association is open to all the students of the College of Arts and Sciences. The purpose of the Association is to enrich the extra-curricular life of the students by sponsoring film series, lecture series, exhibits of art and photography, and concerts.

The Engineering Society is an organization of students in the School of Engineering with the object of familiarizing them with the conduct of public meetings for the acquisition of ease in public speaking. Lectures to the engineering students are given before this body by guest speakers.

The Business Administration Association is an organization of students in the School of Business for the study of business problems and for the encouragement of social activities among the students of the School. Frequent lectures are given before the Association by business men of prominence.

The Student Bar Association is open to all students of the School of Law. It has been established according to the pattern set by the California State Bar Association. It offers easy liaison between students and faculty in the School of Law.

Blackstone Pre-Legal Society is composed of undergraduate students who aspire to attend law school and wish to acquaint themselves with the general duties of the legal profession before beginning their graduate work.

St. Thomas More Society is open to all students of the School of Law and those students of the University who are interested in the philosophy of St. Thomas More. Its activities are primarily spiritual.

Its members attend a quarterly Communion Breakfast and sponsor lectures by prominent Catholic lawyers and religious leaders.

Day Scholars Association promotes active participation of the nonresident students in all the campus activities. It has its own elected officers who work closely with the general student body officers.

Kappa Zeta Phi is a campus organization devoted to the service of the University. It is an honor fraternity composed of students who are above average academically and who are outstanding in campus activities and in loyalty to the University and the student body.

Cross Currents Club is open to all students of the University. Its members invite lectures on controversial topics which, after a formal presentation, are discussed with the audience. This procedure is an experiment in learning by participating in current controversy.

The Student Archaeological Committee is a group of students who assist in the discovery and removal of artifacts, bones, and other remains from ancient Indian burial sites. They help to classify items discovered and to display these in the campus and regional museums.

The International Relations Political Science Club is an organization to study international problems of the past and future and of public affairs generally. It is affiliated with the Carnegie International Clubs.

Mendel Club is an association of students preparing for the study of medicine, organized to investigate scientific subjects and to encourage such activities as are of particular interest to students of biology.

The Mathematics Society is open to all interested students. Its primary purpose is to stimulate interest in mathematics and its applications.

The Clay M. Greene Players is an organization having exclusive charge of the formal dramatic presentations on the campus. Distinguished plays of the past were "The Passion Play of Santa Clara" by Clay M. Greene and "The Mission Play of Santa Clara" by Martin V. Merle. Modern theatrical productions are presented regularly.

The Debating Societies engage in intramural and intercollegiate debates. Highlighting the year's activities are the annual Foch and Ryland debates as well as intercollegiate tournaments. The traditional debating society on the campus is the Literary Congress which held its first meeting on February 22, 1857.

The University Band furnishes its members the opportunity for ensemble playing at the public exercises of the University.

The University Choir and Glee Club furnish vocal music for services in the Mission Church and the public functions of the University.

The ROTC Band performs for Military drill and ceremonies both on and off the campus.

ATHLETICS

Athletics at Santa Clara are directed by the Athletic Council and the Faculty Representative for Athletics, by whom arrangements for intercollegiate and intramural contests are made.

Block S.C. Society. Members of the University teams who have secured the University letter are organized into the Block S.C. Society in recognition of their athletic ability and for the encouragement of a high standard of athletic conduct.

The Athletic Managers Association is composed of volunteers from each class who cooperate with the management in the conduct of games and the care of equipment.

Intramural Sports. Facilities for the athletic activities of the student body are provided by the gymnasium with its basketball court, boxing and wrestling room, and swimming pool; by centrally located tennis and handball courts; and by the extensive athletic fields for football, baseball, track, softball and volleyball. A program of intramural athletics in which all students are encouraged to participate is conducted under the direction of the Director of Intramural Sports.

ATHLETIC OFFICERS

Charles F. Guenther, S.M., M.A. . . . . *Chairman, Athletic Council*
James E. Sweeters, S.J., M.A. . . . . *Athletic Director*
George P. Malley, B.S. . . . . *Football*
Richard A. Gariboldi, B.S. . . . . *Basketball*
Carroll Williams, M.S. . . . . *Minor Sports*

STAFF MEMBERS

William McPherson, B.S.
John Pasco, LL.B.
Al Cadena, B.A.
John C. Cottrell
Alfred Drake, M.A.
Joseph Stein, B.A.
Raymond Andersen, B.S.
Thomas McLaughlin, M.D.
Henry Schmidt, B.S.
Richard W. Degnon, B.A.
Kathryn E. Ivers

STUDENT PUBLICATIONS

The Santa Clara is the official weekly newspaper of the University. It publishes news of the University and affords students an opportunity for practice in newspaper editing, managing, and make-up.

The Redwood is the University annual published by the students to serve as a record of University activities and of the students' achievements.

The Owl is a quarterly literary magazine. It offers a medium of literary expression for the students.

The Santa Clara Lawyer is a quarterly publication issued by the School of Law.

The Alma Studies — A Theological Review is a semiannual publication of the students of the School of Sacred Theology. Its primary purpose is to stimulate theological research and effective writing.

DESCRIPTION OF SCHOLARSHIPS

William J. Adams, Sr. Scholarships: Two annual scholarships ($500 each) contributed in 1962 and subsequently by Florence M. Adams of Santa Cruz, in memory of her husband, Mr. William J. Adams, Sr., for the benefit of two needy and deserving students, one each in the School of Engineering and in the School of Law; selection to be made by the Committee on Scholarships.

Alumni Scholarship: A perpetual scholarship provided by "The Alumni Scholarship Fund" ($1,620) established in 1945 by the University of Santa Clara Alumni Association for the benefit of a deserving student.

Jesse W. Bryan Scholarship: A perpetual scholarship provided by a gift ($12,500) in 1913 from Mrs. Sarah A. Bryan of San Francisco, in memory of her son, Mr. Jesse W. Bryan (S.C. 1891-92), for the benefit of a boarding student.

George T. Cameron Educational Foundation Scholarships: Annual scholarships (totaling $1,000) contributed in 1961 by the Trustees of the George T. Cameron Educational Foundation for the benefit of deserving students.

Magin Catala Scholarship Fund: A perpetual scholarship provided by contributions ($10,000) in 1954 and subsequently by the Catala Club of the University of Santa Clara, for the benefit of a deserving and needy student majoring in Liberal Arts; selection to be made by the President of the University.

James W. Coffroth Scholarships: Perpetual scholarships provided from the Trust Fund ($18,800) established in 1943 at the Wells Fargo Bank, San Francisco, by the bequest of James W. Coffroth of San Diego, for the benefit of needy undergraduate students.

Katherine Connor Scholarship: A perpetual scholarship provided by bequest ($4,500) in 1942 from Miss Katherine Connor of San Jose, for the benefit of students designated by the President of the University.

Robert L. Coward Scholarships: Annual scholarships contributed in 1918 and subsequently by friends of the University, in memory of Mr. Robert L. Coward (S.C. 1896-99), for the benefit of needy and deserving students who are outstanding for contributions to the extracurricular activities of the University.

Crown Zellerbach Foundation Scholarship: An annual scholarship ($1,000) contributed in 1956 and subsequently by the Crown Zellerbach Foundation, for a deserving student; selection to be made by the Committee on Scholarships.

Edward J. Daly Foundation: Scholarships provided by a gift ($20,000) in 1964 from Mr. Edward J. Day, of Oakland, for the benefit of needy and deserving students. Preference shall be given to applicants from Holy Names High School in Oakland, California.

de Saisset-Filipello Scholarship: A perpetual scholarship pro-

vided by a gift ($1,500) in 1944 from Miss Isabel de Saisset and Mrs. E. A. Filipello of San Jose, for the benefit of a student designated by the President of the University.

Hugh C. Donavon Scholarships: Perpetual scholarships provided by a bequest ($5,000) in 1961 from Miss Josephine E. Donavon of San Francisco, in honor of her brother, Rev. Hugh C. Donavon, S.J., long-time Professor of the University, for the benefit of undergraduate students designated by the President of the University.

James Dunne Scholarships: Fifteen perpetual scholarships provided by a gift ($224,604) in 1931 from Mrs. Viola K. Dunne of Hillsborough, in memory of her husband, Mr. James Dunne, (S.C. 1863-74), for the benefit of resident students from the State of California.

Mamie H. Evans Scholarships: Perpetual scholarships provided by "The Mamie H. Evans Memorial Scholarship Fund" ($9,753) established in 1938 by a bequest from Mrs. Mamie H. Evans of Butte City, for the benefit of needy and deserving students.

Farmers Insurance Group Scholarships: Annual scholarships (totaling $570) contributed in 1958 and subsequently by The Farmers Insurance Group, for the benefit of deserving students in the School of Law.

William C. Gianera Scholarships: Perpetual scholarships and grants-in-aid provided by the Fund ($11,259) inaugurated in 1951, by friends of the University in honor of William C. Gianera, S.J., former President of the University (1945-51), for the benefit of needy and deserving students.

Robert E. Gross/Lockheed Aircraft Corporation: Perpetual scholarships or fellowships provided by a gift ($50,000) in 1963 from Lockheed Aircraft Corporation, for the benefit of students majoring in science, engineering, economics, or other fields applicable to the aerospace, marine, manufacturing, or construction industries; selection to be made by the Committee on Scholarships.

Robert and Guillermina Graham Scholarships: Perpetual scholarships provided by a Fund ($22,387) inaugurated in 1950 by Mr. and Mrs. Robert M. Graham, (S.C. 1925-29 and former Bursar of the University), for the benefit of needy and deserving students of the Catholic Faith.

Clausin D. Hadley Scholarship: A perpetual scholarship provided by a gift ($2,500) in 1962 from Martha Hadley of Los Altos in memory of her husband, Dr. Clausin D. Hadley, for the benefit of a needy and deserving student of the School of Business; selection to be made by the Committee on Scholarships.

Robert L. Jacobs Scholarship: A perpetual scholarship provided by a Fund ($1,025) established in 1945 by friends of Mr. and Mrs. Leon Jacobs of San Jose, in honor of their son, Robert L. Jacobs (S.C.

1941-45), who gave his life in World War II, for the benefit of a student designated by the President of the University.

Knights of Columbus Scholarship: An annual scholarship ($550) contributed in 1948 and subsequently by the California Knights of Columbus, for the benefit of a needy and deserving student.

George P. Lauinger Scholarships: Perpetual scholarships provided by bequest ($5,000) in 1962 from Mr. George P. Lauinger of San Mateo, for the benefit of needy students of high scholastic standing; selection to be made by the Committee on Scholarships.

Thomas and Dorothy Leavey Foundation Scholarship: An annual scholarship ($750) contributed in 1958 and subsequently by the Thomas and Dorothy Leavey Foundation, for a deserving student; selection to be made by the Committee on Scholarships.

George H. Mayr Scholarships: Annual tuition scholarships (totaling $4,000) contributed in 1953 and subsequently by the George H. Mayr Educational Foundation of Los Angeles, for the benefit of needy and deserving students from the State of California.

Jennie L. Murphy and Bessie W. Murphy Scholarship Fund: Perpetual scholarships provided through a gift ($5,000) in 1955 from the heirs of the Bessie W. Murphy Estate, in memory of Jennie L. Murphy and Bessie W. Murphy, to be used for worthy students not otherwise able to receive an education; selection to be made by the President of the University.

Edwin J. Owens Scholarship Fund: A perpetual scholarship provided by contributions in 1961 and subsequently by the Catala Club of the University of Santa Clara, in honor of Judge Edwin J. Owens, for the benefit of a needy and deserving student; selection to be made by the President of the University.

John Paul Paganini Scholarship: A perpetual scholarship provided by a gift ($10,000) in 1945 from Mr. Charles M. Paganini and Family of San Francisco, in honor of his son, John Paul Paganini (S.C. 1934-38), who gave his life in World War II, for the benefit of a student designated by the President of the University.

Benjamin Patocchi Scholarship: A perpetual scholarship provided by a bequest ($8,000) in 1949 from Mr. Benjamin J. Patocchi of Sonoma County, for the benefit of a student designated by the President of the University.

James D. Phelan Scholarships: Perpetual scholarships provided by a bequest ($50,000) in 1931 from the Hon. James D. Phelan, former mayor of San Francisco and United States Senator, for the benefit of students designated by the President of the University.

Radio Corporation of America Scholarship: An annual scholarship ($800) contributed in 1950 and subsequently by the Radio Corporation of America, for the benefit of an undergraduate student of

high academic rank in the College of Science or School of Engineering.

John McKenna Scott Scholarship Fund: A perpetual scholarship provided by a bequest ($9,737) in 1957 from Mr. John McKenna Scott of San Francisco, for the benefit of a Mechanical Engineering student selected by the Board of Trustees according to norms indicated by the donor.

Catherine Sexton Scholarship: A perpetual scholarship provided by a bequest ($18,000) in 1946 from Mr. John E. Sexton, Jr., of Palisade, Nevada, in memory of his mother, Mrs. Catherine Sexton, for the benefit of a boarding student from El Dorado County, California.

John Sexton Scholarship: A perpetual scholarship provided by a bequest ($18,000) in 1946 from Mr. John E. Sexton, Jr., of Palisade, Nevada, in memory of his father, Mr. John E. Sexton, Sr., for the benefit of a boarding student from El Dorado County, California.

J. E. Sexton Scholarship: Perpetual scholarship provided by a bequest ($18,000) in 1946 from Mr. John E. Sexton, Jr., of Palisade, Nevada, for the benefit of a boarding student from Eureka County, Nevada.

Earl C. Smart Scholarships: Perpetual scholarships provided by a bequest ($7,500) in 1957 from Mr. Earl C. Smart of San Jose, for the benefit of students designated by the President of the University in accord with the wishes of the donor.

Alice Phelan Sullivan Scholarships: Perpetual scholarships provided by a gift ($6,500) in 1912 and a bequest ($10,000) in 1957 by Noel Sullivan, in memory of his mother, Mrs. Alice Phelan Sullivan of San Francisco, for the benefit of students designated by the President of the University.

The Walter V. Walsh Scholarship Fund: Perpetual scholarships provided by a bequest ($5,000) in 1957 from Mr. Walter V. Walsh of San Francisco, for the benefit of needy and deserving students in the School of Law.

Frank and Alice Walterstein Scholarships: Perpetual scholarships provided by a bequest ($35,916) in 1949 from Mrs. Alice Walterstein, for the benefit of students designated by the President of the University.

Western Electronic Manufacturers Association Scholarship: An annual scholarship ($750) contributed in 1953 and subsequently by the Western Electronic Manufacturers Association, for the benefit of needy and deserving students majoring in Electrical Engineering or in related scientific fields; selected by the Committee on Scholarships.

Western Gear Foundation Engineering Scholarship: An annual scholarship ($500) contributed in 1953 and subsequently by the Western Gear Foundation (of the Western Gear Works), in honor of Philip L. Bannan, to benefit a student in the School of Engineering.

JESUIT SCHOLARSHIPS

HANNA: An annual scholarship ($500) contributed in 1935 and subsequently by the Jesuit Fathers of the University, in honor of His Excellency the Most Reverend Edward J. Hanna, former Archbishop of San Francisco, for the benefit of a needy and deserving student nominated by the incumbent Archbishop from the graduates of Catholic High Schools of the Archdiocese.

BELLARMINE: Eight annual scholarships ($500 each) contributed in 1953 and subsequently by the Jesuit Fathers of the University, for the benefit of needy and deserving students from Bellarmine College Preparatory, San Jose, nominated by the Faculty of that institution.

LOYOLA: An annual scholarship ($500) in the School of Engineering contributed in 1935 and subsequently by the Jesuit Fathers of the University, for the benefit of a needy and deserving student from Loyola High School, Los Angeles, nominated by the Faculty of that institution.

ST. IGNATIUS: An annual scholarship ($500) in the School of Engineering contributed in 1935 and subsequently by the Jesuit Fathers of the University, for the benefit of a needy and deserving student from St. Ignatius High School, San Francisco, nominated by the Faculty of that institution.

BROPHY: Four annual scholarships ($500 each) contributed in 1956 and subsequently by the Jesuit Fathers of the University, for the benefit of needy and deserving students from Brophy College Preparatory, Phoenix, Arizona, nominated by the Faculty of that institution.

SANTA CLARA: A limited number of annual scholarships (amounts according to need) contributed in 1930 and subsequently by the Jesuit Fathers of the University, for the benefit of needy and deserving students selected by the Committee on Scholarships.

SANTA CLARA PRESIDENT: Annual full-tuition scholarships contributed by the Jesuit Fathers of the University, for a graduate of each of the fourteen Jesuit high schools in the west, selected by the principal of each institution from the five seniors with the highest academic rank; renewable for an additional three years by meeting University scholarship requirements.

EMERY: A limited number of scholarships (amounts according to need) in the School of Law, contributed in 1956 and subsequently by the Jesuit Fathers of the University, in honor of James A. Emery (S.C. 1893-96), for the benefit of needy and deserving students selected by the Committee on Scholarships.

GENERAL ACHIEVEMENT AWARDS

Nobili Medal: An annual prize of a gold medal founded by Joseph A. Donohoe, Esq., in honor of the first president of Santa Clara, Rev. John Nobili, S.J., to be given to the student who shall be judged outstanding in personal conduct, school activities, and studies.

Two Silver Medals to be given to the following students who become most distinguished for good conduct and application to study.

1. The most distinguished *Resident* student.
2. The most distinguished *Nonresident* student.

COLLEGE PRIZES

Business Administration Prize: An engraved key given by the Business Administration Association to the senior in the School of Business who shall have made the greatest contribution to the School of Business.

The Chargin Prize: An annual prize of $50 to be given, in honor of Mr. and Mrs. Joseph A. Chargin, Sr., to the senior in the School of Law who has maintained the highest class average in his law course.

Delta Sigma Pi Key: An engraved key given by the Delta Sigma Pi to the senior in the School of Business with the highest scholastic average.

The Isabel Jones Prize: An annual prize of $100 donated in memory of Mrs. Isabel Jones by her husband, Mr. Eliot Jones, to be given to the senior student of the School of Business who is judged by the Faculty of that School to be outstanding in scholarship.

The Charles J. Dirksen Prize: An annual prize of $100 donated by Mr. Eliot Jones in honor of Mr. Charles J. Dirksen to be given to the junior student in the School of Business who is judged by the Faculty of that School to be outstanding in scholarship.

The Orella Prize: An annual award of $75 established in 1915 by the late Dr. Firmin R. Orella, B.S. '89, and founded in 1945 by his wife, Albertine S. Orella, to be given to the senior student in the departments of science who attains the highest average in scientific subjects during the junior and senior years.

The Schwartz Prizes: Two annual prizes of $100 each, donated in 1955 by Mr. Sidney L. Schwartz of San Francisco, to be given to students submitting papers in Finance and Business or Economics which shall be judged outstanding by the Faculty of the School of Business.

DEPARTMENTAL PRIZES

The Religion Prize: A purse of $100 given by the President of the University (1950), to be awarded annually to an upper-division student, for proficiency in theology, selected on conditions set down by the Department of Theology.

Santa Barbara Medals: Four gold medals, given by the President of the University, will be awarded annually, on the recommendation of the Professor in Military Science, to the outstanding cadet in each of the four years of training.

The Sourisseau Prize: An annual prize of $100 founded in 1955 by Miss Eva Sourisseau of San Jose, in honor of her parents and family, to be given to the senior student of the University who shall be selected by the Department of Philosophy for outstanding philosophical achievement.

The Michael Shallo Prize in Political Science: An annual prize of $100 founded in 1955 by the University, in honor of Father Michael Shallo, S.J., Professor of Political Philosophy, to be given to the student of the University selected by competition as the most proficient in political science.

The Civic Club Italian Prizes: Three prizes totaling $100 contributed in 1949 and thereafter by the Civic Club of San Jose, to encourage the study of Italian language and culture, to be given to the students attaining the three successively highest grades in the study of Italian.

The Medal of the Association of the Army of the United States: Awarded to the outstanding cadet of the first year of the Advanced Curriculum of ROTC, for exceptionally meritorious academic attainments, exemplary conduct, efficiency, and fidelity.

Department of the Army Superior Cadet Ribbon Award: Four ribbons awarded annually by the Department of the Army to the outstanding cadet in each academic class of Senior Division ROTC program at the University who has consistently demonstrated potential qualities as an officer.

The Ryland Prizes: The Hon. Caius T. Ryland founded in 1897 an annual purse of $125, leaving its disposition to the discretion of the Faculty. This the Faculty, after due consideration, assigned to the University Literary Congress, organized February 22, 1857, establishing the Ryland Debate to be held yearly between the two branches, the Senate and the House, and divided the purse into three prizes of $70, $35, and $20, respectively. By an agreement between these societies, each in turn selects the subject to be debated, and the other is granted the choice of the side it will defend.

The William H. Leahy Prize: A gold watch, valued at $100.

This prize was founded in honor of Mr. William Leahy by his wife and his brother, Mr. James Leahy, for the winner of the Dramatic Art Contest.

The Handlery Prize: An annual prize of $100 founded by Mrs. Rose Handlery, in memory of her son, Raymond, of the class of 1934, to be given to the senior student of the University who will have contributed most to the success of any of the University student publications.

The McCann Prize: Annual prize of $60 founded in honor of Daniel B. McCann, B.S., '84, to be given for the best short story.

The Redwood Prize: Annual prize of $25 founded in 1908 by the executive committee of *The Redwood*, and given for the best essay on an historical subject.

The Shipsey Poetry Prize: An annual prize of $50 founded in 1954 by Richard M. Schmidt, in honor of the late Reverend Edward Shipsey, S.J., to be presented to the student selected by the Faculty of the Department of English for the most outstanding contribution in the art of poetry.

The Owl Prize: An annual prize of $60 founded by the directors of the former College magazine, *The Owl*, to be given to the winner of an oratorical contest in the University.

Freshman Mathematics Prize: An annual award of books to a freshman student selected by the Mathematics Faculty for excellence in mathematical study and achievement during his freshman year.